NATIONAL HEALTH LIBRARY
1790 BROADWAY
NEW YORK, N. Y.

NATIONAL HEALTH LIBRARY
1790 BROADWAY
NEW YORK, N. Y.

Reg D

AMERICAN JOURNAL OF PUBLIC HEALTH and THE NATION'S HEALTH

The 77th Annual Meeting, New York, N. Y.
October 24–28

RECEIVED
APR 19 1949
NATIONAL HEALTH LIBRARY

11454

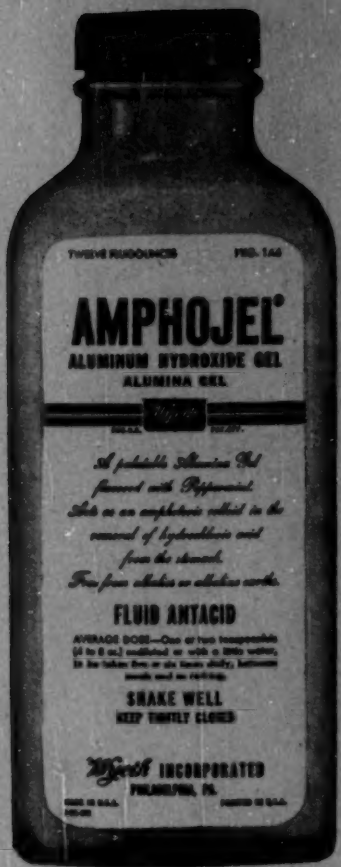
Volume 39 APRIL, 1949 Number 4

SPECIAL BOOK ISSUE

Published Monthly at 374 Broadway, Albany 7, N. Y., by the

AMERICAN PUBLIC HEALTH ASSOCIATION

1790 Broadway (at 58th Street), New York 19, N. Y.



IN THE MEDICAL MANAGEMENT OF PEPTIC ULCER

Parke, Davis & Company

ARE PLEASED TO RECORD THE ACHIEVEMENTS LEADING TO THE DEVELOPMENT OF

CHLOROMYCETIN

Trademark (CHLORAMPHENICOL, PARKE-DAVIS)

CHLOROMYCETIN IS A PURE CRYSTALLINE SUBSTANCE HAVING SPECIFIC ANTIBIOTIC ACTIVITY EFFECTIVE AGAINST AN IMPRESSIVE ARRAY OF MICRO-ORGANISMS

In the history of CHLOROMYCETIN, chance has played little part. Starting from past knowledge of antibiotic activity in soil organisms, thousands of soil samples were collected throughout the world, cultured, and screened for antibiotic properties. Definite activity was found in cultures of *Streptomyces venezuelae*, an organism named for its place of origin. The active antibiotic was then isolated in pure form. Its chemical configuration was determined and reproduced by synthesis. CHLOROMYCETIN is therefore the first antibiotic for therapeutic use that can be produced in quantities by both natural and chemical methods.

The important indications for **CHLOROMYCETIN,** *thus far, include:*

UNDULANT FEVER
BACILLARY URINARY INFECTIONS
PRIMARY ATYPICAL PNEUMONIA
TYPHOID FEVER
TYPHUS FEVER
SCRUB TYPHUS
ROCKY MOUNTAIN SPOTTED FEVER

CHLOROMYCETIN can be administered efficiently by the oral route, yielding effective blood levels. It is supplied in Kapseals of 0.25 Gm.

Descriptive literature will be mailed on request.

PARKE, DAVIS & COMPANY · DETROIT 32, MICHIGAN

MEDICAMENTA VERA · PD CO.

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 39 — April, 1949 — Number 4

CONTENTS

PAGE

The Health Educator's Bookshelf 433
George Rosen, M.D., Ph.D.

Some Public Health Problems in Nuclear Fission Operations 443
Arthur E. Gorman and Abel Wolman, Dr.Eng.

Housing and Health — A Symposium
Sanitary Aspects of the Dwelling 454
M. Allen Pond

Appraisal of Substandard Housing 459
Emil A. Tiboni, M.P.H.

The Provision of Good Housing 462
Catherine Bauer

The Planned Community 467
Frederick J. Adams

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your Library.

Published by the American Public Health Association at 374 Broadway, Albany 7, N. Y.
Executive Office, 1790 Broadway at 58th St., New York 19, N. Y.

NOTICE:—Subscription $7.00 per year for United States, Cuba and Mexico, South and Central America; $7.50 for Canada; and $8.00 for other countries. Single copies 70 cents postpaid.

Copyright, 1949, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to C.-E. A. Winslow, Dr.P.H., Editor, 1790 Broadway, New York 19, N. Y.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany 7, N. Y., or 1790 Broadway at 58th St., New York 19, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932, under the Act of March 3, 1879.

Acceptance for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917.

"Alhydrox"®

means

ALUMINUM HYDROXIDE ADSORBED

"Alhydrox" is a handy contraction doctors are also using oftener these days. To them it describes a *plus value* in Cutter immunization products.

What "Alhydrox" does—The selectivity of aluminum hydroxide controls the adsorption of antigens, thus reducing dosage while maintaining a high antibody concentration. After injection the "Alhydrox" adsorbed antigens are released gradually, prolonging stimulation through slow absorption.

What "Alhydrox" means to doctors and their patients—Alhydrox assures doctors of higher antitoxin levels that are longer lasting. The favorable pH of aluminum hydroxide lessens pain on injection and cuts side reaction to a minimum. Rare indeed are crying youngsters and nervous mothers (fathers, too) who complain about reactions like persistent nodules.

CUTTER'S NEW CERTIFICATE OF IMMUNIZATION has been so popular with doctors and nurses the country over that the first big quantity printed ran out in a hurry. More are being printed now and can be procured, free of charge, by asking your Cutter detail man or writing Cutter Laboratories, Berkeley, California.
Dept. D-9

- **Pertussis Phase I Alhydrox**
  30,000 million H pertussis per cc.
- **Diphtheria Toxoid Alhydrox**
- **Tetanus Toxoid Alhydrox**
- **Diptussis Alhydrox** ®
  Cutter Diphtheria Toxoid plus 20,000 million H pertussis per cc., for simultaneous immunization against pertussis and diphtheria.
- **Diphtheria Toxoid–Tetanus Toxoid Alhydrox**
  For simultaneous immunization against diphtheria and tetanus.
- **Dip-Pert-Tet Alhydrox***
  Cutter diphtheria, pertussis, tetanus combined vaccine for simultaneous immunization against diphtheria, pertussis, tetanus.

*Trademark

"Alhydrox" is exclusive with — **CUTTER**

Contents—Continued PAGE

Q Fever — A Symposium
History and Present Status 471
R. E. Dyer, M.D.

Experimental Q Fever in Cattle 478
E. J. Bell, Sc.D., R. R. Parker, Ph.D., and H. G. Stoenner, D.V.M.

Q Fever Survey in Southwest Texas 485
J. V. Irons, Sc.D., Joseph N. Murphy, Jr., M.S.P.H.S., A. B. Rich, D.V.M., and Austin E. Hill, M.D., M.P.H.

Complement-Fixing Antibodies with *C. burnetii* Antigens in Various Geographic Areas and Occupational Groups in the United States . . 492
Elias Strauss, M.D., and S. Edward Sulkin, Ph.D.

The Epidemiology of Accidents 504
John E. Gordon, M.D.

Bacillus subtilis, an Interfering Organism in the Enterococci Test 516
Grace McCormack

Use of Auxiliary Personnel in Dental Care Programs 517
R. M. Walls, D.D.S.

EDITORIALS:
The Health Educator's Bookshelf 525
Housing and the Health Officer 525
Facing the Facts of Life 527
The Problem of Heart Disease 529

Clearing House on Public Health Salary Information and Personnel Needs . 531

A New Step in the Accreditation Program 535

Books and Reports 536

Books Received 545

A Selected Public Health Bibliography 547
Raymond S. Patterson, Ph.D.

Association News 550
Applicants for Membership. Engineering Section Project Continued for 1949. Progress of the Merit System Service, A.P.H.A.

Employment Service 556

News From the Field 561

Conferences and Dates 576

Reprint prices furnished upon request

The "Shattuck Report"

Republished for the first time!

"One of the most remarkable documents—perhaps the most significant single document in the history of Public Health."
C.-E. Amory Winslow

Report of the Sanitary Commission of Massachusetts: 1850

By Lemuel Shattuck and Others

THIS is the famous first general plan for the promotion of public health to be presented to an American governmental body, and its influence over the whole field ever since that time can hardly be exaggerated. The "Shattuck Report" made fifty specific recommendations regarding sanitation, recording of vital statistics, protection of school children, medical research, nurses' training, slum clearance, and other problems vital to the increase of the mean expectation of life in the United States. Its first proposal was for the creation of state and local boards of health in an era when such state commissions were non-existent.

Lemuel Shattuck (1793–1859) was a business man—a bookseller and publisher—whose important public services include plans for the recording and preservation of public documents, and the establishment (due to his efforts) of the Massachusetts System for the registration of births, deaths, and marriages. In 1839 he was one of the founders of the American Statistical Association.

Now republished for the first time since its original release in 1850, this facsimile edition of the "Shattuck Report" again makes it available to everyone interested in medicine, public health, or the vital statistics and social conditions of the mid-nineteenth century. It is sponsored by the American Public Health Association, the Massachusetts Public Health Association, the Harvard Graduate School of Public Health, the Massachusetts Department of Public Health, and the Boston Health Department. *ix + 321 pages, $4.50*

Order from

AMERICAN PUBLIC HEALTH ASSOCIATION
1790 Broadway, New York 19, N. Y.

Reprints from the American Journal of Public Health

American Public Health Association. [November, 1947.] 10 pp. Editorial. Free.

Bibliography of Public Health Motion Pictures and Film Strips. [February, 1949.] 3 pp. 15c.

Changing Challenges of Public Health. C.-E. A. Winslow. [March, 1945.] 8 pp. 15c.

Food Utensil Sanitation Proposed as Official Association Procedure Committee on Research and Standards. [May, 1948.] 3 pp. 10c.

How to Find What Health Education Materials You're Looking For. [August, 1944.] Revised 1948. 4 pp. 10c.

Improvement of Local Housing Regulation Under the Law. [Nov., 1942.] 16 pp. 25c.

Laboratory Methods Used in Determining the Value of Sulfadiazine as a Mass Prophylactic Against Meningococcic Infections. By Colonel Dwight M. Kuhns, M.C., USA, and Captain Harry A. Feldman, M.C., AUS. [December, 1943.] 8 pp. 10c.

Landmarks, (1944) by Abel Wolman, William Shepard, et al. [January, 1945.] 28 pp. 25c.

Lemuel Shattuck—Still a Prophet. [February, 1949.] 27 pp. 25c.

Medical Care in a National Health Program. An Official Statement of the American Public Health Association Adopted October 4, 1944. [December, 1944.] 6 pp. Single copies free. Five or more copies 5c each.

Microbiological Methods for Frozen Dessert Ingredients. [1948.] 28 pp. 40c each.

Principles for Consideration in Judging the Probable Effectiveness of Federal Legislation Designed to Improve the Health of Children of School Age. [April, 1948.] 4 pp. 10c each.

Problem of Proper Illumination. [July, 1948.] 1 p. 5c each.

Recommended Methods for Rabies Control. [January, 1948.] 4 pp. Free.

Standard Methods for the Exam. of Dairy Products, Chapter II, 60 pp. 75c.

Surveys of the Nutrition of Populations. John B. Youmans, E. White Patton, and Ruth Kern. [December, 1942 and January, 1943.] 24 pp. Uncovered 20c, covered 25c.

The Present Status of the Control of Air-Borne Infections. Report of the Subcommittee for the Evaluation of Methods and Control of Air-Borne Infections [January, 1947.] 10 pp. 25c.

Typhoid Vaccine Studies: Revaccination and Duration of Immunity. By Don Longfellow and George F. Luippold. [Nov., 1940.] 7 pp. 15c.

Use of Body Measurements in the School Health Program. Harold C. Stuart and Howard V. Meredith. [December, 1946.] 21 pp. 25c.

Ventilation and Atmospheric Pollution. E. R. Hayhurst, Chairman. [July, 1943.] 7 pp. Uncovered 15c, covered 25c.

Vitamin B Complex. II. Status of Assay Methods and Need of These Substances by Man. [July, 1944.] 12 pp. 25c.

Who Is Un-American Now? Editorial. [December, 1947.] 4 pp. Free.

Order from the Book Service — Advance Payment is Requested

AMERICAN PUBLIC HEALTH ASSOCIATION

1790 Broadway at 58th Street New York 19, N. Y.

INDEX TO ADVERTISERS

	Page
American Public Health Association:	
Book Service	
VII, VIII, XXI, XXVIII, XXX, XXXII, LXI, LXII	
Membership Application	LIII
Sustaining Members	XXXVII
American Can Company	LX
American Meat Institute	LXIII
American Optical Company	LIX
American Seal-Kap Corporation	XLVI
American Sterilizer Company	LVIII
American Water Works Association	XXXIV
Appleton-Century-Crofts, Inc.	XXXV
Blakiston Company, The	XXXIII
Bristol Laboratories	LVII
Burroughs Wellcome & Company	LVI
Cargille Scientific, Inc.	576
Cereal Institute, Inc.	LV
Certified Blood Donor Service	LIV
Clay-Adams Company, Inc.	LII
Columbia University Press	XXXII
Commercial Solvents Corporation	LI
Commonwealth Fund, The	XXXI
Corning Glass Works	L
Crown Cork & Seal Company	XLIX
Cutter Laboratories	V
Difco Laboratories	Back Cover
Directory of Health Service	XLI
Bendiner & Schlesinger Laboratories	
Black & Veatch	
Merit System, A.P.H.A.	
Dixie Cup Company	XLVIII
Dorrance Company	XXX
Dutton, E. P. & Co., Inc.	XXII
Elmer and Amend	XLVII
Emerson Books, Inc.	XXIX
Fisher Scientific Company	XLVII
Funk & Wagnalls Company	XXVI
Garrard Press, The	XXV
Gart Pharmacal Co., The	XLI
Grune & Stratton, Inc.	XXVII
Harvard University Press	XXIV
Health Education Council	XXIII
Hoeber, Paul B., Inc.	XX
International Universities Press, Inc.	XVIII
Iodine Educational Bureau, Inc.	XLVI
Lawrence Aero-Mist Sprayer Co.	XLV
Lea & Febiger	XVIII
Lederle Laboratories	XLIV
Little, Brown & Company	XIX
Macmillan Company, The	XVII
McGraw-Hill Book Company, Inc.	XVI
Mosby, C. V., Company, The	XIV
National Confectioners' Association	XLIII
National Dairy Council	XLII
Nelson, Thomas & Sons	XV
Parke Davis & Company	III
Pennsylvania Salt Manufacturing Company	XLI
Putnam's Sons, G. P.	XIII
Rexair Division, Martin-Parry Corp.	LIII
Reynolds, R. J., Tobacco Company	XL
Ronald Press Company, The	XII
Squibb, E. R., & Sons	XXXIX
University of Oklahoma Press	XI
Van Nostrand Company, D., Inc.	XXXIV
Wallace & Tiernan Company, Inc.	XXXVI
Wiley, John & Sons, Inc.	X
Williams & Wilkins Company, The	IX
Winthrop Stearns, Inc.	XXXVIII
Wyeth, Inc.	II

NEW BOOKS FOR THE PUBLIC HEALTH OFFICER

Zacks: **Photoradiography in Search of Tuberculosis.**

Twenty years of experience in the control of tuberculosis by clinics, surveys and conferences form the basis for the material in this book. It should be required reading for any group contemplating mass radiography, because its warnings on avoiding trouble are clear, its attention to detail meticulous, and its aid in making case findings a permanent part of each community commendable. In introducing mass chest radiography to the civilian population the author prefers a sustained, systematic attack. Emphasis is placed on planning the campaign so that it contributes to furthering tuberculosis research. (Publication scheduled for April.)

Approximately 400 pp., 274 figs., price to be announced.

Fairhall: **Industrial Toxicology.**

In this reference manual of toxicology, the author describes the toxicity of new as well as old substances used in industry. Under each heading he discusses characteristics, industrial uses, toxicity and analysis, and lists pertinent references. The text material is divided into two groups—inorganic substances and the carbon compounds. Substances in each group are then arranged alphabetically for greater ease in reference. 400 pp. (1949) $6.00.

Coburn and Young: **Epidemiology of Hemolytic Streptococcus.**

This is the first and only well-controlled study of such huge proportions ever to be reported. It presents the work done by the Epidemic Disease Control Section of the Division of Preventive Medicine, U. S. Navy, of which Dr. Coburn was the director. Many valuable lessons for the control of civilian epidemics can be learned from the Navy experience. 236 pp., 31 figs. (1949) $5.00.

Frazer and Stallybrass: **Textbook of Public Health. Twelfth Edition.**

This is as complete a text as could be desired. Included are chapters on industrial hygiene, water, sewage disposal, and housing. Maternity and child welfare and school medical service are minutely described. Of great interest are the chapters on marine hygiene and hospital administration. There is a new chapter on social services.

582 pp., 78 figs. (1948) $8.50.

Currie and Mearns: **Hygiene, A Manual of Public Health. Third Edition.**

The momentous changes in the field of medicine in the last few years have made necessary a more comprehensive treatment of the subject matter, and an expansion of the fields covered. The book has undergone complete revision and been greatly enlarged. New sections are those on health education and medical climatology.

744 pp., 212 figs., 4 color plates (1948) $9.00.

THE WILLIAMS & WILKINS COMPANY

Mt. Royal and Guilford Aves. Baltimore 2, Maryland

Two authoritative books on public and industrial HEALTH problems

PUBLIC HEALTH ENGINEERING

Volume I

By **EARLE B. PHELPS**, Professor Emeritus of Sanitary Science of the School of Public Health, College of Physicians and Surgeons, Columbia University, and Professor of Sanitary Science, College of Engineering, University of Florida.

In *Public Health Engineering*, the author presents a unified treatment of environmental sanitation. Volume I concentrates on two major factors, air and water. The author explains, in the light of present day knowledge of sanitary science, what protective devices to build, and why they are chosen. The trained engineer will find the emphasis on the public health aspect especially valuable. Chemistry and the biological sciences form the approach to the subject. For this reason, the book is also particularly useful to the medically trained student of public health.

1948 656 pages illustrated $7.50

INDUSTRIAL HEALTH ENGINEERING

By ALLEN D. BRANDT

Medical Division, Bethlehem Steel Company

This book shows how to recognize the health hazards of various industries, and makes concrete suggestions on how to combat them. INDUSTRIAL HEALTH ENGINEERING lists over 1,000 hazardous occupations, from balloon inflators to straw-hat makers. Each occupation is indexed for quick reference to a table of health hazards that tells in details just what the job dangers are. Using these tables with the text, it is easy to determine not only what specific jobs in a particular industry are dangerous, but also why—and what can be done to make them safe.

1947
395 pages 154 illustrations
$6.00

ON APPROVAL COUPON

JOHN WILEY & SONS, INC.
440 Fourth Ave., New York 16, N. Y.

Please send me, on 10 days' approval, a copy of

☐ Phelps' PUBLIC HEALTH ENGINEERING @ $7.50
☐ Brandt's INDUSTRIAL HEALTH ENGINEERING @ $6

If I decide to keep the book(s), I will remit price plus postage; otherwise, I will return the book(s) postpaid.

Name .....
Address .....
City .....Zone.....State.....
Employed by .....
(Offer not valid outside U. S.) AJPH-4-49

How can men eat "good" meals– and still be undernourished?

Mineral Nutrition of Plants and Animals

By Frank A. Gilbert

Battelle Memorial Institute

"HIDDEN HUNGER" lurks in the food we eat. . . . Healthy men require healthy foods adequately fortified with proper minerals. In this important survey, you will find discussions of many books and articles dealing with mineral nutrition. A noteworthy addition to the mounting literature on the values of trace elements to plants and animals, it classifies mineral elements in nutrition and presents a sketch of the early history of plant nutrition—from Aristotle to Liebig. Here you will find the answers to such questions as: What causes low crop production, abnormally developed plants? "Hairless" hogs? Lean livestock?

This important adjunct to source material in the field of nutrition serves as a foundation for more intensive research in seeking better food for the health of the nation. 144 pages, fully documented with illustrations and an excellent bibliography. $2.75

THE FOOD YOU EAT:

A Practical Guide to Home Nutrition

By Samuel and Violette Glasstone

Completely keyed to today's food realities, this book by one of the foremost scientists and his wife includes necessary diets for healthier living. "Solid, helpful information."—*American Cookery. Illustrated*, $2.25

WHAT TO DO ABOUT VITAMINS *By Roger J. Williams*

Director of Biochemical Institute, Univ. of Texas

Authoritative guide to vitamins and minerals, how they are necessary in the diet and how they may be secured in wholly adequate quantities. Profusely illustrated with tables, graphs, and charts. $1.00

Send No Money!

Examine these books FREE!

Mail this coupon today.

UNIVERSITY OF OKLAHOMA PRESS, Dept. PH-4
NORMAN, OKLAHOMA

Please send me (write in titles) for 10 days' free examination. I will pay postman full amount of each book plus a few cents postage with the understanding that if I am in any way dissatisfied I may return the books for a complete refund. (You save postage on cash orders; same return privilege.)

_____

_____

_____

Name .....

Address .....

City .....Zone.....State.....

A *Check List* of Helpful Reference Books for Public Health Workers

☐ **Studies in Psychosomatic Medicine**
Franz Alexander, M.D., Thomas M. French, M.D., *and the Staff of the Chicago Institute for Psychoanalysis. 568 pages. 14 Ill.* $7.50

☐ **Psychoanalytic Therapy**
Also by Alexander-French, et al. *353 pages.* $5.00

☐ **Insight and Personality Adjustment**
Therese Benedek, M.D., *Chicago Institute for Psychoanalysis. Revised printing. 305 pages.* $4.00

☐ **The Psychology of Abnormal Behavior**
Louis P. Thorpe and Barney Katz, *University of Southern California. 877 pages. 46 Ill. 44 tables.* $6.00

☐ **Voluntary Health Agencies**
Selskar M. Gunn, *Rockefeller Foundation, and* Philip S. Platt, *N. Y. Assoc. for the Blind. Foreword by* Louis I. Dublin. *364 pages. 18 tables.* $3.00

☐ **Hidden Hunger**
Icie G. Macy and Harold H. Williams, *both Research Laboratory, Children's Fund of Michigan. 286 pages.* $3.00

☐ **Microbes Militant**
A Challenge to Man
Frederick Eberson, M.D., *Kennedy Hospital, Memphis, Tenn. A revision. 401 pages. 26 Ill.* $4.50

☐ **The Money Value of a Man**
Louis I. Dublin and Alfred J. Lotka, *Metropolitan Life Ins. Co. Revised edition. 8 charts. 57 tables.* $6.00

☐ **Psychology for the Profession of Nursing**
Jeanne G. Gilbert, *Fordham University, and* Robert D. Weitz, *Long Island University. 260 pages.* $3.00

☐ **An Introduction to Clinical Psychology**
L. A. Pennington, *University of Illinois,* Irwin A. Berg, *Northwestern University, and 23 Contributing Specialists. 595 pages. 42 Ill.* $5.00

☐ **The Abnormal Personality**
Robert W. White, *Harvard University. 613 pages.* $5.00

☐ **Child Psychology and Development**
Louis P. Thorpe, *University of Southern California. 781 pages. 105 Ill. 41 tables.* $4.50

☐ **Personality and the Behavior Disorders**
J. McV. Hunt and 40 Contributing Specialists. *2 volumes. 1242 pages. 39 Ill. 20 tables.* $10.00

☐ **The Diabetic's Handbook**
Anthony M. Sindoni, Jr., M.D., *Chief, Dept. of Metabolism, Philadelphia General Hospital, and* 6 Contributing Specialists. *7 Ill. 13 tables.* $3.00

☐ **Health and Hygiene**
Lloyd Ackerman, *Western Reserve University. Revised printing. 895 pages. 59 Ill. 27 tables.* $4.50

☐ **The Length of Life**
A Study of the Life Table
Louis I. Dublin and Alfred J. Lotka, *Metropolitan Life Ins. Co. Revision in preparation.*

☐ **Intelligence and Its Deviations**
Mandel Sherman, *University of Chicago. 286 pages. 19 Ill. 19 tables.* $3.75

☐ **Health Education in Schools**
Jesse F. Williams, *Columbia University, and* Ruth Abernathy, *University of Texas. 328 pages.* $3.50

Write Dept. 521 for free folder describing these books in detail

Order books from

THE RONALD PRESS COMPANY, 15 E. 26th St., N.Y. 10

Putnam Books for Nurses

NURSING IN MODERN SOCIETY

By MARY ELLA CHAYER

The author discusses frankly and fairly the nursing problems of the present, and sets forth her ideas for future patterns so vividly that the reader will be stimulated to constructive thinking. Price $3.75

ESSENTIALS OF NURSING

By HELEN YOUNG, ELEANOR LEE and ASSOCIATES

Second Revised Edition

Although this book was intended especially for students, its emphasis on the Sociological and Psychological aspects of nursing fit it admirably in furnishing graduate nurses with a modern reference and review volume. Price $3.75

NURSING IN PREVENTION AND CONTROL OF TUBERCULOSIS

By H. W. HETHERINGTON and FANNIE ESHLEMAN

A notable text for students and an outstanding reference work for all public health workers prepared by two exceptionally well qualified authors. Price $3.50

G. P. Putnam's Sons • 2 West 45 Street, New York 19

Publishers for Nurses since 1878

New Mosby Books

IN THE FIELD OF PUBLIC HEALTH

- **Turner's PERSONAL AND COMMUNITY HEALTH**

  New Eighth Edition. With the help of suggestions from many specialists, this book has been thoroughly revised and brought up to date. New material includes a self-appraisal chart for evaluating personal health. There has been a thorough reorganization of the material on communicable diseases with the addition of a new chapter on this subject. The latest statistical data in the field of public health is included.

  There are new sections dealing with such topics as voluntary health agencies, new developments in nutrition, the Rh factor, DDT, new insect repellants, new antibiotics, gamma globulin, and many other developments in the field of health and preventive medicine. 568 pages, illustrated. (1948) Price, $4.00

- **Turner's SCHOOL HEALTH AND HEALTH EDUCATION**

  This book presents a picture of the modern school health program from the standpoint of its opportunities for health education. It is written for the course in School Health or in Health Education in the Teachers' College and for the teachers in service. Methods, curriculum building, source materials and other phases of health education are presented in detail.

  Its scope is broad and authoritative and its use will improve health programs—as well as the relations between directors and personnel. 457 pages. (1947) Price, $3.50

- **Cureton's PHYSICAL FITNESS, APPRAISAL AND GUIDANCE (With Collaborators)**

  Dr. Cureton and his associates have measured the physical fitness of thousands of normal young men and women on the Urbana Campus of the University of Illinois and have demonstrated differences in scoring, undoubtedly interpretable in terms of health levels. This book is the record of these experiments. It was written with the hope that it will help others in similar appraisals of their students—and that it will help to standardize the methodology of such work. 566 pages, illustrated. (1947) $6.00

- **Cureton's PHYSICAL FITNESS WORKBOOK**

  A Manual of Conditioning Exercises and Standards, Tests and Rating Scales for Evaluating Physical Fitness.

  Profusely illustrated, this manual contains complete descriptions of the exercises and conditioning activities that are recommended. With its use individual records may be kept evaluating personal progress in physical fitness. One of the most important inclusions in this workbook is the series of rating scales based on the most modern statistical procedures and in line with the most approved educational use for such scales. 150 pages, illustrated. (1947) $2.50

- **O'Keefe-Fahey's EDUCATION THROUGH PHYSICAL ACTIVITIES**

  The purpose of this book is to provide comprehensive materials, suggest teaching procedures and techniques, and discuss ways of evaluating programs of physical education and recreation. Suggestions and plans are submitted in non-technical terms in order that they may be used by classroom teachers, recreational leaders, and parents, as well as by specialists. Special attention is brought to activities that contribute to the development of the upper portion of the body and to activities and equipment for out-of-school use. 325 pages, illustrated. (1949) Price, $4.00

- **Top's COMMUNICABLE DISEASES**

  Second Edition. Every chapter in this edition has been revised and improved. Three chapters have been completely rewritten: Influenza, Malaria, and Rickettsial Diseases. It contains fourteen new chapters as follows: Coccidioidomycosis, Rheumatic Fever, Primary Atypical Pneumonia, Epidemic Diarrhea of the Newborn, Infections Hepatitis, Chancroid, Lymphogranuloma Venereum, Granuloma Inguinale, Ophthalmia Neonatorum, Epidemic Keratoconjunctivitis, Leptospiral Jaundice, Ringworm of the Scalp, Trachoma and Infectious Mononucleosis. 947 pages, 98 illustrations, 13 color plates. (1947) Price, $9.50

The C. V. MOSBY Company

Scientific Publications

3207 Washington Blvd.
St. Louis 3, Missouri

720 Post Street
San Francisco 9, Calif.

A momentous work!

A vitally important subject!

Virus Diseases of Man

C. E. van ROOYEN, M.D., D.Sc. (Edin.), M.R.C.P. (London)
Research Member and Professor of Virus Infections, University of Toronto

A. J. RHODES, M.D., F.R.C.P. (Edin.)
Research Associate and Associate Professor in Virus Infections, University of Toronto

SECTIONAL LIST OF CONTENTS

Section 1. Technique

Section 2. Diseases of the Skin and Mucous Membrane

Section 3. Infective Fevers of Virus Origin

Section 4. Some Arthropod-Spread and Other Tropical Infections

Section 5. The Common Cold and Influenza

Section 6. Virus Infections of the Eye

Section 7. The Pneumonitis-Psittacosis-Lymphogranuloma Group

Section 8. Rabies and Pseudorabies

Section 9. The Poliomyelitis Group

Section 10. Virus Meningitis

Section 11. Diseases Characterized Chiefly by Encephalitis, Encephalomyelitis or Myelitis

Section 12. Infective Hepatitis and Serum Jaundice

1216 pages **44 illustrations** **CLOTHBOUND** **PRICE: $22.50**

TERMS: $4.50 with order, $3.00 monthly

Send for your copy TODAY!

ORDER THROUGH YOUR BOOKSTORE OR USE THIS COUPON!

THOMAS NELSON & SONS
385 Madison Ave.
New York 17, N. Y.

Please send me a copy of van Rooyen & Rhodes' VIRUS DISEASES OF MAN. Price $22.50.

☐ Check herewith. ☐ Send invoice.

☐ Herewith $4.50. I will remit $3.00 monthly until balance is paid.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Announcing

two significant McGraw-Hill books for every public health worker

Now in preparation

Lemkau's MENTAL HYGIENE IN PUBLIC HEALTH

By PAUL V. LEMKAU, M.D., Associate Professor of Public Health Administration and Director of the Mental Hygiene Study, Johns Hopkins School of Hygiene and Public Health.

The important and practical relation between mental hygiene and public health is described in this new book designed to give public health workers effective techniques and programs for promoting and protecting the mental health of the population in their everyday work. Dr. Lemkau traces the development of the personality, demonstrating at each stage the possibilities for modification in the direction of better mental health.

McGraw-Hill Series in Health Science
Approximately 450 pages, 6 x 9, illustrated.

Bridge's EPILEPSY AND CONVULSIVE DISORDERS IN CHILDREN

By EDWARD M. BRIDGE, M.D., Research Professor of Pediatrics, School of Medicine, University of Buffalo; Director of Research, Children's Hospital of Buffalo; formerly Associate in Pediatrics, Johns Hopkins School of Medicine.

Ready soon

A presentation of experiences accumulated in the Epilepsy Clinic at Johns Hopkins over a period of fifteen years. This practical book emphasizes the psychiatric and sociological aspects of the disease as well as the more purely medical problems. Details of practical management of afflicted children and the problems of caring for them at home, in school and in the community are among the special features of the book.

McGraw-Hill Series in Health Science
Approximately 550 pages, 6 x 9, illustrated.

OTHER McGRAW-HILL PUBLICATIONS VALUABLE IN PUBLIC HEALTH

FUNDAMENTALS OF HUMAN REPRODUCTION
Edith L. Potter, M.D... $3.50

CAREERS FOR NURSES
Dorothy Deming, R.N... $3.50

A PSYCHOLOGY OF GROWTH
Bert I. Beverly, M.D... $2.75

RURAL HEALTH AND MEDICAL CARE
Frederick D. Mott, M.D. and Milton I. Roemer, M.D., M.P.H..... $6.50

FATIGUE AND IMPAIRMENT IN MAN
S. Howard Bartley, Ph.D. and Eloise Chute, M.A. $5.50

McGRAW-HILL BOOK CO., Inc.
Health Education Department
330 West 42nd St.
New York 18, N. Y.

SYPHILIS: IT'S COURSE AND MANAGEMENT

This book explains clearly the new quick-treatment of syphilis through the use of penicillin. The book is based on the findings of the author who has been director of the Rapid Treatment Center, Bellevue Hospital, since its inception in 1944. It provides undergraduates and practitioners alike the latest needed knowledge of methods of diagnosis, prognosis, and treatment.

Evan W. Thomas, M.D.

To Be Published in April

THE VENEREAL DISEASES, 2nd ed.

This new second edition offers the latest information on the treatment of the venereal and allied diseases. It includes information on the use of penicillin as well as the latest advances in arsenotherapy. Excellent illustrations along with masterful text presentation make this a practical book for practitioner or student.

James Marshall, M.D.

369 pp. Illus. $5.50

TAKING THE CURE

A practical guide for the tuberculosis patient. The author, once a patient himself, explains in simple language what tuberculosis is and how it is cured. He gives practical suggestions on how to be comfortable in bed and how best to get accustomed to various clinical procedures as well as how to make the needed mental adjustment.

Robert G. Lovell, M.D.

93 pp. Illus. $2.00

PREVENTIVE MEDICINE AND PUBLIC HEALTH

The modern concept of preventive medicine applied to private practice! The author stresses the important function of the private physician with regard to the public's health and shows how his work is linked with the public health agency. Included are sections on such subjects as Bio-Statistics; Promotion of Child Health; Social and Economic Factors and Their Influence Upon Disease, etc.

Wilson G. Smillie, M.D.

607 pp. $6.00

PUBLIC HEALTH ADMINISTRATION IN THE UNITED STATES, 3rd ed.

A source book of prevailing and recommended principles and practices in public health administration. It offers the latest information on the administrative control of communicable diseases, basic activities of a health organization, and public health programs.

Wilson G. Smillie, M.D.

637 pp. Illus. $6.50

AN INTRODUCTION TO PUBLIC HEALTH, 2nd ed.

A background text for all beginning students in public health. It clearly defines problems and analyzes programs and practices in the field of public health. Only facts that will prove most useful in orienting the student and helping him to develop sound perspectives are considered.

Harry S. Mustard, M.D.

283 pp. $3.50

COMMUNICABLE DISEASE CONTROL

One of the most authoritative books on this subject written to date. It discusses in detail the various control measures utilized for protection of the community's health and the relative effectiveness of these measures. The diseases chosen for discussion are those of greatest interest to most communities in the United States and Canada. Emphasis is on procedures that protect the population as a whole rather than on protection of the individual.

Gaylord W. Anderson, M.D. and Margaret G. Arnstein, R.N.

450 pp. Illus. $5.00

THE MACMILLAN COMPANY 60 Fifth Ave., New York 11

INTERNATIONAL UNIVERSITIES PRESS, Inc.

IMPORTANT BOOKS

SEARCHLIGHTS ON DELINQUENCY
New Psychoanalytic Studies. K. R. Eissler, M.D., Ph.D., Managing Editor... $10.00

THE PSYCHO-ANALYTICAL APPROACH TO JUVENILE DELINQUENCY
Theory, Case Studies, Treatment. By Kate Friedlander, M.D., LRCP..... $5.50

THE PSYCHOANALYTIC STUDY OF THE CHILD. Vol. III/IV
Anna Freud, Heinz Hartmann, M.D., Ernst Kris, Ph.D., Managing Editors.... $10.00

ADOLESCENCE
Its Social Psychology. By C. M. Fleming, Ph.D..... $4.50

CHILDHOOD AND AFTER
By Susan Isaacs, D.Sc..... $4.50

YOUR CHILD MAKES SENSE
A Guide Book for Parents. By Edith Buxbaum, Ph.D. Foreword by Anna Freud..... $3.25

At your bookstore or at:

INTERNATIONAL UNIVERSITIES PRESS, Inc.
227 West 13th Street • New York 11, N. Y.
Ask for free catalogue P.

LEA & FEBIGER Books on Public Health

Joslin—
Diabetic Manual
For the Doctor and Patient
New (8th) Edition 260 Pages
Illustrated, 1 Plate in Color $2.50

Thomas—
Dietary of Health and Disease
308 Pages, Illustrated $3.50

Morrison and Chenoweth—
Normal and Elementary Physical Diagnosis
Fourth Edition
373 Pages, 184 Illustrations $5.00

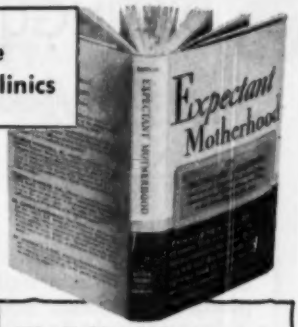
Thorndike—
Athletic Injuries
Prevention, Diagnosis, Treatment
New (3rd) Edition 243 Pages
114 Illustrations $3.75

Stone and Dufault—
Pulmonary Tuberculosis
325 Pages, 93 Illustrations $3.50

Schwartz, Tulipan and Peck—
Occupational Diseases of the Skin
Second Edition
146 Illustrations and 1 Plate in Color
964 Pages $12.50

LEA & FEBIGER, *Publishers*
600 Washington Square - - Philadelphia 6, Pa.

The book that has saved time, trouble and money for thousands of doctors and clinics



Expectant Motherhood

By Dr. Nicholson J. Eastman

Professor of Obstetrics in Johns Hopkins University and Obstetrician-in-Chief to the Johns Hopkins Hospital

TWENTY big printings since publication show what EXPECTANT MOTHERHOOD means to the busy obstetrician; show how this book has won its way to a leading position in medical literature. More and more doctors every day are ordering and re-ordering EXPECTANT MOTHERHOOD for their patients. You too can save time, money and trouble with EXPECTANT MOTHERHOOD, the complete, calm, understanding, authoritative and reassuring guidebook through pregnancy that has won unstinted praise from doctors everywhere.

The Table of Contents of **EXPECTANT MOTHERHOOD**

Signs and Symptoms of Pregnancy
Growth and Development of the Fetus
Diet and Hygiene in Pregnancy
Weight Control in Pregnancy
Common Discomforts and their Treatments
Danger Signals
Preparations for the Baby
The Birth of the Baby
"Painless Childbirth"
Convalescence from Childbirth
The Newborn Baby
Index

With many illustrations and drawings

Here's what Doctors say:

● "I consider it one of the outstanding contributions in the field and recommend its reading freely."—DR. GEORGE W. KOSMAK, *Editor of American Journal of Obstetrics and Gynecology.*

● "A copy of this book is given to each new obstetric patient upon her first consultation and is most enthusiastically received. The information contained . . . RELIEVES ME OF NUMEROUS TELEPHONE CALLS."—DR. CUTHBERT POWELL, *Consulting Gynecologist, Denver General Hospital.*

● "It is the best book in this field. I use it constantly in my practice."—DR. HERBERT F. TRAUT, *Obstetrician and Gynecologist in Chief, University of California Hospital.*

● "With Dr. Eastman's EXPECTANT MOTHERHOOD in the home both the patient and the father-to-be have a wealth of correct information available at all times. It helps reduce nuisance symptoms and complaints to a minimum and therefore is A TIME SAVER FOR THE PHYSICIAN!"—DR. FREDERICK C. FREED, *Clinical Professor of Obstetrics and Gynecology, New York University Medical School.*

● "We have been using Eastman's EXPECTANT MOTHERHOOD ever since it was first published. Our patients find it very helpful and we consider it a valuable aid in our prenatal care."—DR. GEORGE KAMPERMAN, *Chief Obstetrician and Gynecologist and Chief of Staff, Harper Hospital, Detroit, Michigan.*

● "In my opinion, this is by far the best book on the subject."—DR. EMERSON L. STONE, *Associate Clinical Professor of Obstetrics and Gynecology, Yale University.*

Special Offer to Doctors

More than a thousand doctors and clinics have ordered EXPECTANT MOTHERHOOD. Four out of five order it in quantity lots of 10 to 500 for the use of their patients.

To give you the opportunity of examining the book itself we will send you on approval an examination copy and quote discounts on quantity orders. If you are not completely satisfied return the book in 10 days and the bill will be cancelled.

AJPB-4

LITTLE, BROWN & COMPANY
34 Beacon St., Boston 6, Mass.

☐ Please send me_____copies of EXPECTANT MOTHERHOOD at $1.50 per copy.

☐ Please send me an examination copy on a 10 day approval basis.

Name_____

Address_____

City_____Zone___State_____

☐ Charge ☐ Send C.O.D. ☐ Check Herewith

DISTINGUISHED HOEBER BOOKS

for Public Health Workers

New 2nd Edition

Hall's PUBLIC HEALTH STATISTICS

THIS HIGHLY SUCCESSFUL WORK has been used both as a textbook and in practical application. It offers a clear, understandable background for the manipulation and analysis of pubilc health data. *By Marguerite F. Hall, Ph.D. Asst. Prof. of Public Health Statistics, School Public Health, Univ. Michigan, foreword by Halbert L. Dunn, M.D., In Press.*

New Book

MODERN TRENDS IN PUBLIC HEALTH

THE LATEST DEVELOPMENTS in the field of public health are offered by 23 authorities—each an expert in his own field. Covering a broad area of practical problems, this book makes available a wealth of practical help to the active Public Health Worker. *Arthur Massey, M.D., D.P.H., Editor. 600 pp., 42 illus., $12.50.*

3rd Edition

McClung's MICROSCOPICAL TECHNIQUE

THIS STANDARD AND AUTHORITATIVE laboratory manual will soon be ready in a thoroughly revised, up-to-date 3rd Edition. Designed for practical everyday use, the new edition covers new topics, includes new contributions and contains new information throughout. *Edited by Ruth McClung Jones, Ph.D., In Press.*

2nd Edition

Harvey and Hill's INSECT PESTS

DISCLOSING THE ADVANCES of recent times, this practical manual offers a convenient and complete guide to the control and eradication of each important type of insect pest. *358 pp., 27 illus., $5.00.*

---------- Paul B. Hoeber, Inc. ----------

MEDICAL BOOK DEPARTMENT OF HARPER & BROTHERS
49 EAST 33RD ST., NEW YORK 16, N. Y.

PLEASE SEND ME ON APPROVAL:

☐ Hall's STATISTICS....In Press
☐ MOD. TR. IN PUBLIC HEALTH $12.50
☐ McClung's MICRO. TECHNIQUE In Press
☐ Harvey & Hill's INSECT PESTS $5.00

☐ On Approval ☐ Charge my Acct. ☐ Check Enclosed

Name .....

Address .....Zone.....State.....

When writing to Advertisers, say you saw it in the JOURNAL

DOES YOUR CITY
KNOW ITS HOUSING PROBLEM?

Just where and how big are the slums? How substandard are they, and in what ways?

Can part of the problem be solved by enforcement of reasonable housing codes?

What families need new housing, and how much can they pay for it?

These and other basic questions of housing policy can be answered with data from

AN APPRAISAL METHOD FOR MEASURING THE QUALITY OF HOUSING:

A Yardstick for Health Officers, Housing Officials and Planners

This is the survey technique, developed by the American Public Health Association's Committee on the Hygiene of Housing, of which Abel Wolman has said:*

> **"It is one of the major contributions to translating opinion into objective measurement in one of the most difficult fields of appraisal."**

Officially adopted by health departments in cities ranging from Battle Creek and Brookline to Milwaukee, St. Louis and Los Angeles, this method is now being promoted by the U. S. Public Health Service.

The Method is Completely Described in the Following Publications:

Part I. NATURE AND USES OF THE METHOD **$1.00**
This introductory volume is written for the policy-making official. In 53 readable pages, with many illustrations, it tells how practical housing programs can be shaped from an objective survey.

Part II. APPRAISAL OF DWELLING CONDITIONS **$5.00**
Three separate manuals give step-by-step instructions to the local survey director, the field crew and the office staff of a dwelling survey.

Part III. APPRAISAL OF NEIGHBORHOOD ENVIRONMENT **In Press**
Similar instructions are given for measuring the physical adequacy of neighborhoods.

* American Journal of Public Health, August 1945.

Order from the Book Service

The American Public Health Association

1790 Broadway at 58th Street New York 19, N Y.

Now—the Personal Approach to Public Health

HOW TO LIVE LONGER

by Justus J. Schifferes, Ph.D.

Formerly instructor in health education, Teachers College, Columbia University
With a Foreword by Ralph F. Sikes, M.D., M.P.H.

Lively, authoritative, comprehensive
A vital new book to read and recommend

HERE is a book that may help to prolong your own life. Professionally recommended, it will help you in your task of preventing the 250,000 untimely deaths—"involuntary suicides"—that occur in the U. S. each year.

AUTHORITIES and critics praise it highly. Dr. Frank Slaughter in *The New York Times* said: "It should certainly attract many readers of all ages. . . . Deals with the most important phase of disease control, health education. . . . Gives in simple words the latest information now available." . . . Morris Fishbein, M.D., editor of the *Journal of the American Medical Association*, writes: "I find it exceedingly readable with some new presentation of data about medicine and health that will be most helpful." . . . Charles C. Wilson, M.D., Professor of Education and Public Health at Yale University declares, "An interesting story . . . Modern concepts of important health problems are presented in clear language". *Modern Medicine* said: "Helpful . . . tells enough but not too much."

St. Louis Post Dispatch review said: "REFRESHING in its air of substance and authority. . . . Robs statistics of their dry-as-dust complexion. . . . Perfectly clear. . . . Not a book of home remedies. . . . The essence of this book is the orderly discussion of the 11 principal causes of death in our country: Heart disease, cancer, apoplexy, accidents, kidney disease, pneumonia, tuberculosis, premature birth, diabetes, suicide and syphilis. . . . It is to Dr. Schifferes' lasting credit that he teaches this without scaring the daylights out of his readers."

READ *How to Live Longer* for your own protection and recommend its adoption as a useful text for *adult health education* and in colleges. Order today. Get 25 percent discount by using coupon below. Clip and send immediately to

E. P. DUTTON & CO., INC.
300 Fourth Ave., New York 10, N. Y.

EDUCATIONAL ORDER COUPON

To: E. P. Dutton & Co., Inc., 300 Fourth Ave., New York, N. Y.

Send me ..... copies (y) of HOW TO LIVE LONGER by Justus J. Schifferes, Ph.D. I am entitled to an educational discount of 25% from retail price of $3. I am enclosing $..... Postage-free if cash, check or money order accompanies order. C.O.D. orders you pay postman a few cents extra. Money back in 10 days if you are not completely satisfied.

NAME .....
(Please Print)
TITLE OR POSITION .....
INSTITUTION .....
STREET ADDRESS .....ZONE.....
CITY AND STATE .....
AJPH-449

25% DISCOUNT

if ordered on Educational Order Coupon. State your title and institution. Also available at your booksellers. Retail price $3. 255 pages, 1949. A Health Education Council Book.

105,000 Copies Already Distributed!

Suggested SCHOOL HEALTH POLICIES . . 2nd edition revised

by the National Committee on School Health Policies

In Japan it is counteracting effects of the atomic bomb... How many copies can you use in America?

AMERICAN military government teams in Japan have ordered SUGGESTED SCHOOL HEALTH POLICIES to help them rehabilitate the Japanese school system. Fifteen copies went to atom-bombed Nagasaki. A staff member of the Hyogo Military Government Team sent an order in February, 1949.

SUGGESTED SCHOOL HEALTH POLICIES has now crossed the traditional mark of the "best-seller"—an astonishing achievement for a health publication. More than 105,000 copies have been distributed. Orders have come from Canada, England, Hawaii and Peru. In the United States, in Arkansas alone, 9,000 copies were distributed through the State Board of Health! But every state has ordered.

QUANTITY purchasers have included the American Public Health Association, the American Medical Association, the National Tuberculosis Association as well as state, county and city Boards of Health and Boards of Education and local chapters of voluntary health agencies.

A personal copy of SUGGESTED SCHOOL HEALTH POLICIES for reading, study and reference should be in the hands of every public health nurse and every school teacher—as well as administrative officials and many parents of school children. "Recommended to all persons concerned with public health in schools," said the *New England Journal of Medicine.*

SUGGESTED SCHOOL HEALTH POLICIES is the work of a committee representing 15 major organizations concerned with health and education in the United States. It is the accepted, standard guide for putting effective school health policies into action. Put it to work in your schools and community. How many copies do you need? See FREE BOOK offer on coupon below. Order today from

HEALTH EDUCATION COUNCIL

10 Downing St., New York 14, N. Y.

LOW PRICE LIST

	Each
1 to 99 copies	25¢
100 to 999 copies	22¢
1,000 to 4,999 copies	20¢
5,000 or more copies	17¢
With stiff covers,	*add each*
100 or less copies	5¢
More than 100 copies	3¢

Transportation costs extra. Prices subject to change without notice.

48 PAGES
READABLE — AUTHORITATIVE

QUANTITY ORDER COUPON

To: Health Education Council, 10 Downing St., New York 14, N. Y.

Number please? Send us ..... copies of SUGGESTED SCHOOL HEALTH POLICIES.
If desired with stiff paper covers, check here .....
One FREE COPY of book HOW TO LIVE LONGER by Justus J. Schifferes, with orders for 100 or more copies of "Suggested School Health Policies", if this coupon accompanies order and is checked here ..... Transportation FREE if cash, check or money-order (payable to Health Education Council) is enclosed.
Send and bill as follows:

NAME .....
(Please Print)
INSTITUTION OR ORGANIZATION.....
ADDRESS .....
SIGNATURE .....DATE.....
AJPH-449

3 essential books for everyone concerned with the health of the American people

THE HOSPITAL IN CONTEMPORARY LIFE

Edited by Nathaniel W. Faxon, M.D.

Table of Contents

THE DEVELOPMENT OF THE HOSPITAL, by Edward D. Churchill, M.D., John Homans Professor of Surgery, Harvard, etc.
THE RELIEF OF SUFFERING, by Henry K. Beecher, M.D., Henry I. Dorr Professor of Research in Anesthesia, Harvard, etc.
HUMAN NATURE AND THE UNDERSTANDING OF DISEASE, by Stanley Cobb, M.D., Bullard Professor of Neuropathology, Harvard, etc.
THE CARE OF THE PATIENT, by Leland S. McKittrick, M.D., Asst. Professor of Surgery, Harvard, etc.
THE EDUCATION OF THE DOCTOR, by Oliver Cope, M.D., Assoc. Professor of Surgery, Harvard, etc.
HOW MEDICINE GROWS AND ITS RELATION TO SCIENCE, by Eugene M. Landis, M.D., George Higginson Professor of Physiology, Harvard, etc.
UNSOLVED PROBLEMS, by Joseph C. Aub, M.D., Professor of Research Medicine and Director of the Medical Laboratories of the Collis P. Huntington Memorial Hospital, etc.
THE PLACE OF THE HOSPITAL IN THE SOCIAL ORDER, by Nathaniel W. Faxon, M.D., Director of the Massachusetts General Hospital and Director of the Massachusetts Eye and Ear Infirmary. *$5.00*

PUBLIC HEALTH IN THE WORLD TODAY

Edited by James Stevens Simmons Assistant Editor, Irene M. Kinsey
Foreword by James Bryant Conant

Contents

INTRODUCTION
MR. LaBAR AND WORLD HEALTH, by James Stevens Simmons, Brig. Gen., U. S. Army (ret.), Dean, Harvard School of Public Health.

THE PROFESSION OF PUBLIC HEALTH
THE EVOLUTION OF PUBLIC HEALTH AND ITS OBJECTIVES, by C.-E. A. Winslow, Professor Emeritus of Public Health, Yale.
PUBLIC HEALTH BECOMES A PROFESSION, by Reginald M. Atwater, Exec. Sec., American Public Health Assn.
THE STATISTICAL EVALUATION OF MEDICAL-CARE NEEDS, by Lowell J. Reed, Vice-Pres., Johns Hopkins.
NUTRITION RESEARCH AND ITS RELATION TO PUBLIC HEALTH, by Charles Glen King, Scientific Director, The Nutrition Foundation, Inc.
MEDICAL EDUCATION AND ITS RELATION TO PUBLIC HEALTH, by George F. Lull, Sec. and General Manager, A.M.A.
PUBLIC HEALTH, PREVENTIVE MEDICINE, AND THE PRACTICING PHYSICIAN, by Hugh J. Morgan, Prof. of Medicine, Vanderbilt.

PUBLIC HEALTH IN THE UNITED STATES TODAY
THE HISTORY AND FUNCTIONS OF THE UNITED STATES PUBLIC HEALTH SERVICE, by Joseph W. Mountin, Asst. Surgeon General, Assoc. Chief, Bureau of State Services, U. S. Public Health Service.
THE RESEARCH PROGRAM OF THE UNITED STATES PUBLIC HEALTH SERVICE, by Rolla Eugene Dyer, Asst. Surgeon General, Nat'l Institute of Health, U. S. Public Health Service.
THE ARMY'S PART IN THE HEALTH PROGRAM OF THE NATION, by Maj. Gen. Raymond W. Bliss, The Surgeon General, U. S. Army.
THE HEALTH PROGRAM OF THE UNITED STATES NAVY, by Rear Adm. C. A. Swanson, The Surgeon General, U. S. Navy.
THE VETERANS ADMINISTRATION MEDICAL PROGRAM AND THE PUBLIC HEALTH OF THE COUNTRY, by Paul R. Hawley, Medical Director, Blue Cross and Blue Shield.
THE VOLUNTARY HEALTH AGENCY AND THE NATION'S HEALTH PROGRAM, by Basil O'Connor, Chairman, American Red Cross.
FROM A PIONEER IN THE POISONOUS TRADES, by Alice Hamilton, Asst. Prof. of Industrial Medicine, Emeritus, Harvard.

PUBLIC HEALTH PROGRAMS AND PROBLEMS ABROAD
THE CHILD IN WORLD HEALTH AND SOCIAL WELFARE, by Martha M. Eliot, Assoc. Chief, U. S. Children's Bureau; Pres., Amer. Public Health Assn.
PUBLIC HEALTH ADMINISTRATION IN THE FAR EAST, by Marshall C. Balfour, Field Staff, Int'l Health Division; Regional Director for the Far East, and The Rockefeller Foundation.
THE IMPORTANCE OF TROPICAL MEDICINE AND PUBLIC HEALTH TO INDUSTRY IN DEVELOPING NEW ECONOMIES AND MARKETS, by Edward I. Salisbury, Medical Director, United Fruit Co.; Pres., Amer. Society of Tropical Medicine.

PUBLIC HEALTH IN A NEW ERA
PUBLIC HEALTH AND THE DISEASES OF OLD AGE, by Louis I. Dublin, Second Vice-Pres. and Statistician, Metropolitan Life Insurance Co.
THE BEARING OF INVESTIGATIONS OF ACUTE RESPIRATORY INFECTION ON PUBLIC HEALTH, by Alphonse Raymond Dochez, Prof. of Medicine, College of Physicians and Surgeons, Columbia.
PUBLIC HEALTH PROBLEMS OF TRANSPORTATION, WITH SPECIAL REFERENCE TO AVIATION, by Ross A. McFarland, Asst. Prof. of Industrial Medicine, Harvard.
THE ENGINEER IN PUBLIC HEALTH, by Abel Wolman, Prof. of Sanitary Engineering, Johns Hopkins.
NEW PUBLIC HEALTH PROBLEMS OF THE ATOMIC ERA, by Karl Z. Morgan, Director, Health Physics Division, Oak Ridge National Laboratory.
NATIONS UNITED FOR HEALTH, by James A. Doull, Medical Director; Chief, Office of Int'l Health Relations, U. S. Public Health Service. Coming April 27, *$5.00*

REPORT OF THE SANITARY COMMISSION OF MASSACHUSETTS, 1850

By Lemuel Shattuck and Others **$4.50**

Order from

HARVARD UNIVERSITY PRESS *Cambridge 38, Massachusetts*

35 YEAR INDEX
OF
AMERICAN JOURNAL OF PUBLIC HEALTH

Volumes 1 to 35 for the Years 1911 to 1945

AUTHORS AND SUBJECTS

All of the literature published on a given subject in the Journal during the years 1911 through 1945 will be found in one place. The Index makes available a vast storehouse of valuable information contained in the fifty thousand pages published during this period.

The Index covers original papers, editorials, committee reports and matters pertaining to the Association. Titles have been examined for all key words so that each title should be sufficiently cross indexed. Every page in the 35 volumes indexed was examined. The yearly indexes were used as a check against the entries.

The tremendous task of preparing the Index was done by Louise Pickens Tanner and Fred Wilbur Tanner, who are experienced workers in science possessing the knowledge and appreciation of care and accuracy so necessary in an effort of this kind.

The American Public Health Association has authorized the preparation and publication of this cumulative index and recommends it as a valuable addition to the libraries of all public health workers.

340 PAGES — 6¾ x 9¼ **PRICE $7.00**

BOUND IN BUCKRAM

THE GARRARD PRESS, PUBLISHERS

Champaign, Illinois

FUNK & WAGNALLS

announce for this Spring

the first Newsweek book

MEDICINE ON THE MARCH

A PROGRESS REPORT

by Marguerite Clark

Head of Newsweek's Medicine Department

→MARGUERITE CLARK is an executive editor in the National Association of Science Writers — and one of the few women members. Her specialization has made her one of the twenty competent science writers in the country; her book the kind of reporting that has won her the confidence of the entire professional world "for consistently accurate, informative articles on medicine."

DURING the five-year war period American medicine advanced 25 years. The 18 chapters of this book, each a separate report on a separate medical condition, cover the work of hundreds of top medical specialists and researchers in America and include the latest treatments, surgical techniques and drugs that have been used with success — telling by whom, where, and what the future promises. The book covers heart ailments . . . high blood pressure . . . cancer . . . tuberculosis . . . infantile paralysis . . . psychiatry . . . child mental health . . . epilepsy . . . surgery . . . new drugs . . . allergy . . . rehabilitation . . . special rehabilitation of hemaplegics and paraplegics . . . pediatrics . . . geriatrics . . . alcoholism . . . atomic medicine. Here is straight, down-to-facts medical reporting that the layman can trust.

At all bookstores, $3.50

FUNK & WAGNALLS COMPANY, 153 East 24th Street, New York 10, N. Y.

Selected New Books for the Public Health Worker

☐ **DEMENTIA PRAECOX**

by LEOPOLD BELLAK, M.D. The only up-to-date complete reference work on the number-one mental health problem.

470 pages ***$10.00***

☐ **BIOLOGY OF MENTAL DEFECT**

by L. S. PENROSE, M.D. Applies the recent discoveries in medical genetics to psychopathological conditions encountered in mental deficiency practice.

About 300 pages ***$4.75***

☐ **GROUP-ANALYTIC PSYCHOTHERAPY**

by S. H. FOULKES, M.D. Presents group analysis as a form of psychotherapy and as a method of studying groups and the behavior of individuals in their social aspects.

195 pages ***$4.50***

☐ **PERSONAL MENTAL HYGIENE**

by THOMAS VERNER MOORE, M.D. Basic ideas on the prevention and self-correction of mental ills are balanced by shrewd personal counsel.

365 pages ***$4.50***

☐ **PSYCHODIAGNOSIS**

by SAUL ROSENZWEIG, PH.D. An introduction to the art and science of psychodiagnosis that explains the psychometric and projective approaches of 22 psychologic tests.

400 pages ***$5.00***

☐ **CHILD HEALTH AND DEVELOPMENT**

edited by R. W. B. ELLIS, M.D. Deals with intellectual, emotional and instinctive development and with social and welfare aspects, from nurseries to juvenile courts.

372 pages ***$4.50***

☐ **PSYCHOPATHOLOGY AND EDUCATION OF THE BRAIN-INJURED CHILD**

by DR. A. A. STRAUSS, and L. E. LEHTINEN. "A stimulating and thought-provoking piece of work in a field which has often been considered hopeless." —*Yale Journal of Biology and Medicine.*

220 pages ***$5.00***

☐ **HOSTILITY IN YOUNG CHILDREN**

by ANNELIESE F. KORNER, PH.D. Penetrates the problems and frustrations of young children as they arise at home and in day-school. Makes you understand child hostility as released in play and real-life situations.

202 pages ***$3.50***

☐ **CHILD OFFENDERS**

by HARRIET GOLDBERG, PH.D. This book of annotated and interpreted case histories—"displays an unusual combination of practitioner's skill with a flair for research and warm human sympathy." —*St. Louis Post-Dispatch.*

228 pages ***$4.00***

Please send, on approval, a copy of the books checked above.

Name .....

Address .....

☐ *Charge my account* ☐ *Check enclosed*

GRUNE & STRATTON, Inc.

381 Fourth Avenue, New York 16, N. Y.

Announcing the publication of

DIAGNOSTIC PROCEDURES IN VIRUS AND RICKETTSIAL DISEASES

This handbook, prepared by the Committee on Virus and Rickettsial Diseases of the Laboratory Section and edited by the Chairman of the Committee, Thomas F. Francis, Jr., M.D., details procedures which can be employed and interpreted by laboratory workers in the diagnosis of sixteen virus diseases. The diseases selected are essentially those of man for which procedures are available for use in a diagnostic laboratory.

Each of the sixteen sections has been written by an authority in the field. Much of the experience of each author has been contributed to his chapter and as a result the entire volume constitutes a compilation of methods proved by actual experience.

The volume has grown out of a recognized need for a publication of collected methods and has developed from a round table presentation at the Annual Meeting of the American Public Health Association in 1946. The methods are not presented as standards but are those most currently useful.

Members of the committee who have contributed and their subjects are as follows:

Psittacosis
K. F. Meyer, Ph.D., M.D. and B. Eddie, Dr.P.H.

Lymphogranuloma Venereum
Geoffrey Rake, M.B.

Trachoma and Inclusion Blennorrhea
Phillips Thygeson, M.D.

Variola and Vaccinia
Robert F. Parker, M.D.

Influenza
George K. Hirst, M.D.

Primary Atypical Pneumonia
A. E. Feller, M.D.

Mumps
John F. Enders, Ph.D., and Jeanette H. Levens, M.P.H.

Poliomyelitis
John R. Paul, M.D.

Encephalitis (Arthropod-borne Virus Encephalitides and Lymphocytic Choriomeningitis)
William McD. Hammon, M.D., Dr.P.H.

Rabies
H. N. Johnson, M.D., M.B., and Thomas F. Sellers, M.D., M.Sc.

Herpes Simplex
T. F. McNair Scott, M.D.

Yellow Fever
John C. Bugher

Dengue
Albert B. Sabin, M.D.

Phlebotomus (Pappataci or Sandfly) Fever
Albert B. Sabin, M.D.

Rickettsial Diseases
I. Isolation and Identification of Rickettsial Agents
Norman H. Topping

II. Serologic Procedures for the Diagnosis of Rickettsial Diseases
Joseph E. Smadel

352 pages, 20 illustrations **Price, $4.00**

Order from the Book Service
The American Public Health Association
1790 Broadway at 58th Street New York 19, N Y.

Emerson Books, Inc.

SEX FULFILLMENT IN MARRIAGE

By Ernest R. Groves, Gladys Hoagland Groves, and Catherine Groves

"Rarely has it been the reviewer's privilege to read a book which he can so whole-heartedly endorse as this latest volume by the Groves'."—*American Sociological Review*

"The scientific and yet easily readable approach to this subject makes this a volume that can be widely recommended."—*Journal of the American Medical Association* $3.00

SEX LIFE IN MARRIAGE

By Dr. Oliver M. Butterfield

"This book . . . discusses the sexual side of marriage with frankness and clearness."—*Church Management*

"The best manual to give."—*Ohio State Medical Journal* $2.00

SEX TECHNIQUE IN MARRIAGE

By Isabel Emslie Hutton, M.D.

"'A clear, succinct, non-emotional, authoritative and conservative exposition of the practical factors involved in making marriage successful on the sexual level.' That describes the book exactly."—*Hygeia* $2.00

SEX EDUCATION: A Guide for Parents, Teachers and Youth Leaders

By Cyril Bibby

"It would be hard to find a sounder and better balanced discussion of the subject."—*Family Life Education.*

"Contains a wealth of essential information and teems with practical suggestions."—*The Bulletin of the National Association of Secondary-School Principals* $2.50

HOW LIFE IS HANDED ON

By Cyril Bibby

"A wonderful book for adolescents, to explain reproductive systems of man and beast. The style of writing is easy and direct. Illustrations are informative and ample. The book explains things as most parents wish they could."—*Journal of the American Medical Association*

"In this charmingly written book Cyril Bibby has made a real contribution to the literature in this field. It is intended primarily for children and young adolescents, but parents, teachers, and youth leaders will find it invaluable."—*Journal of Social Hygiene* $2.00

VD MANUAL FOR TEACHERS

By Samuel D. Allison, M.D., and June Johnson

"Recommended as a constructive, intelligent and welcome contribution in the field of public health education."—*Quarterly Review of Biology*

"A very welcome help to teachers in a field which has been neglected much too long in far too many places." — *Bulletin of the Johns Hopkins Hospital* $2.00

PSYCHOLOGY OF SEX

By Havelock Ellis

"The best of all available books on this subject."—*Hygeia*

"Written in clear interesting fashion—good literature as well as good science, from a man who knows sociology and human relationships as well as biology and medicine."—*Journal of Social Hygiene* $3.00

PREPARATION FOR MARRIAGE

By Ernest R. Groves

"Thought-provoking and convincing. . . . Written in simple, friendly language, presenting the various aspects of marriage with a wholesome, outspoken seriousness."—*Mental Hygiene* $1.75

SEX EDUCATION IN HIGH SCHOOLS

By John Newton Baker

"As important to mental hygiene and psychiatry as to social hygiene and sociology, and psychiatric workers will find (this) book both instructive and interesting."—*Psychiatric Quarterly* $2.00

YOUR SKIN AND ITS CARE

By Howard T. Behrman, M.D., and Oscar L. Levin, M.D.

"The type of book to which the physician can refer his patients who want more information than can be obtained during the average consultation session."—*Journal of the American Medical Association*

"The sound advice contained in this book should do much to insure a healthy complexion by directing the reader's thoughts into proper channels, both as to the cause of the complaint, and as to the remedial measures necessary for its correction."—*Connecticut State Medical Journal*

"Offers in readable style facts on some of the problems that plague people; it explains the how and why."—*Hygeia* $2.50

BEAUTY PLUS

By Mary MacFadyen, M.D.

"The author . . . seems to have caught the idea of making sound hygiene attractive. The book is cleverly illustrated and is a most interesting volume of general advice for women on health, beauty, recreation and the sex life."—*Journal of the American Medical Association* $2.49

THE HYGIENE OF THE BREASTS

By Clifford F. Dowkontt, M.D.

"This much-needed treatise on a too-little-understood subject is most welcome."—Beulah France, R.N. in *The American Baby*

"A very commendable job for the laity." — *Connecticut State Medical Journal* $2.50

EMERSON BOOKS, INC.

251 West 19th St. New York 11, N. Y.

Did you know that

less than sixty years ago tomatoes were thought to cause cancer; kerosene lamps were just coming into use; eggs were 8 cents a dozen—butter 12 cents a pound?

Dr. Crumbine, from the *New Yorker*

FRONTIER DOCTOR

by Samuel J. Crumbine, M.D.

reminisces about these and other amazing facts about his practice as a frontier physician and pioneer health officer in Dodge City, Kansas in the 1880's. Dr. Crumbine, as State Health Officer for Kansas did a notable job for that state and the nation waging a planned warfare against houseflies and rats, the common drinking cup and roller-towel and for many of the progressive steps in public health in America. Don't miss the vigorous, photographic story of this pioneer in health. **$3.00**

At all book stores • **DORRANCE & COMPANY, Publishers** • **Philadelphia**

Publications of the A.P.H.A.

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. 1945. 71 pp. $1.00.

A.P.H.A.-Year Book 1947–1948. 112 pp. $1.00.

Part II. Appraisal of Dwelling Conditions. Director's Manual; Field Procedures; Office Procedure (1946). $5.00.

Basic Principles of Healthful Housing. 2nd ed. rev. 1946. Report of the Committee on the Hygiene of Housing. 34 pp. $.40.

Control of Communicable Diseases, The. 6th ed., 1945. Size 4¼" x 7¾". 149 pp. $.35.

Diagnostic Procedures and Reagents. Technics for the Laboratory Diagnosis and Control of the Communicable Diseases. 2nd ed., 1945. $4.00.

Diagnostic Procedures for Virus and Rickettsial Diseases. 1948. 347 pp. $4.00.

Directory of Public Health Statisticians, 4th Ed. Oct. 1948 (free to members of the Vital Statistics Section) $1.00.

Health Practice Indices, 1943–1946. A collection of charts showing the range of accomplishment in various fields of community health service, 1947. 77 pp. Free.

Membership Directory. 1946. (Free to A.P.H.A. members.) $5.00.

Methods for Determining Lead in Air and in Biological Materials. 1944. 41 pp. $.75.

Occupational Lead Exposure and Lead Poisoning. 1943. 67 pp. $.75.

Panum on Measles. By P. L. Panum (translation from the Danish). Delta Omega ed., 1940. 111 pp. $2.50.

Photographic Sediment Chart, 1947 ed., $1.50.

Planning the Neighborhood. Committee on the Hygiene of Housing, 1948. 89 pp. $2.50.

Proceedings of the National Conference on Local Health Units. Supplement to A.J.P.H., Jan. 1947. 160 pp. Covered, $1.00.

Proceedings of the Princeton Conference on Local Health Units, September 1947. $.50

Public Health: A Career with a Future. Rev. ed. 1948. $.15.

Public Health in Midstream. Papers presented at the Special Sessions at Atlantic City. Supplement to A.J.P.H., Jan. 1948. $1.00.

Shellfish and Shellfish Waters, Recommended Methods of Procedure for Bacteriological Examination of. 1947. 12 pp. $.25.

Standard Methods for the Examination of Dairy Products, 9th ed., 1948. 373 pp. $4.00.

Standard Methods for the Examination of Water and Sewage. 9th ed., 1946. 286 pp. $4.00.
Physical and chemical examination of water and sewage, miscroscopical examination of water and bacteriological examination of water.

Survey Form for Milk Laboratories. Indicating Conformity with Standard Methods for the Examination of Dairy Products (8th ed.). May, 1944. Single copies 10c; 50 copies $1.00; 100 copies $1.50; 1,000 copies $10.00.

Swimming Pools and Other Public Bathing Places, Recommended Practice for Design, Equipment and Operation of. 1942. 56 pp. $.50.

Check above the publications desired and mail this advertisement to us, together with your remittance to cover (check, money order, or stamps). Members of the Association are entitled to 10% discount on the above.

Name.....Address.....

Order from the Book Service — Advance Payment is Requested

AMERICAN PUBLIC HEALTH ASSOCIATION

1790 Broadway at 58th Street **New York 19, N. Y.**

THE COMMONWEALTH FUND

Announcing Two New Publications . . .

CHILD HEALTH SERVICES AND PEDIATRIC EDUCATION

The nation-wide survey of the Committee for the Study of Child Health Services of the American Academy of Pediatrics, with the cooperation of the U. S. Public Health Service and the U. S. Children's Bureau.

The first study of this type ever undertaken, this is a comprehensive inventory and analysis of the services of physicians and dentists in private practice, of hospitals and community health agencies, both official and voluntary, and pediatric education.

$3.50

OFFICE MANAGEMENT FOR HEALTH WORKERS

By Frances King & Louis L. Feldman

This practical book adapts the principles of established office practice to the needs of a health department office or voluntary agency, and it provides for the first time a reference text for the health administrator and a guide for the training of all workers in the field of public health. It gives special attention to management and personnel problems, equipment needs, and various kinds of records and systems of record-keeping and filing.

$2.25

Other Public Health Books

PUBLIC HEALTH LAW . *1947 Revised Edition*

By James A. Tobey, Dr.P.H., LL.D.

The third edition of this standard work on public health law has been expanded to include approximately 250 new court decisions, recent alterations in governmental organization and administration, and important legislative trends. Written especially for health officials, teachers of public health, and attorneys. ***440 pages, $4.50***

MILK AND FOOD SANITATION PRACTICE

By H. S. Adams

A practical text in the field of environmental sanitation designed to help public health engineers and sanitarians bridge the gap between theory and practice—between what should be done and how to do it. The essential and fundamental principles of milk and food control are presented with special emphasis on the practical and educational application of these principles in the sanitary supervision of such supplies. ***328 pages, $3.25***

GOVERNMENT IN PUBLIC HEALTH

By Harry S. Mustard, M.D.

Dr. Mustard traces the development of public health service in the United States from social and governmental standpoints. He deals with the complex relationships of federal, state, and local health services and points up the health problems of today. He delineates public health service as it is, projects probable trends into the future, and considers the effects of these potential developments. ***235 pages, $1.50***

THE COMMONWEALTH FUND

41 East 57th Street **New York 22, N. Y.**

PUBLIC MEDICAL CARE

Principles and Problems

FRANZ GOLDMANN

"This book is a masterful marshalling of material and is highly stimulating. . . . It is highly recommended to public health officers, hospital administrators and their trustees, and those interested in social security legislation."—*American Journal of Public Health.* **$3.00**

forthcoming

THE CHICAGO-COOK COUNTY HEALTH SURVEY

Conducted by the United States Public Health Service.

The first comprehensive analysis of the health facilities of a large community.

$15.00 (tentative)

Columbia University Press

2960 Broadway New York 27, N. Y.

REPORTS OF THE COMMITTEE ON PROFESSIONAL EDUCATION

(Officially Approved by the Governing Council of the A.P.H.A.)

Desirable Qualifications of Nurses Appointed to Public Health Nursing Positions in Industry
Educational and Experience Qualifications of Public Health Laboratory Workers
Educational Qualifications of Executives of Voluntary Health Associations
Educational Qualifications of Community Health Educators
Educational Qualifications of Health Officers
Educational Qualifications of Industrial Hygienists
Educational Qualifications of Medical Administrators of Specialized Health Activities
Educational Qualifications of Nutritionists in Health Agencies
Educational Qualifications of Public Health Dentists
Educational Qualifications of Public Health Engineers
Educational Qualifications for Public Health Nursing Personnel
Educational Qualifications of Public Health Statisticians
Educational Qualifications of Sanitarians
Educational Qualifications of School Physicians
Report on Field Training of Public Health Personnel

Reprints are available without charge
Address requests to the

Book Service

AMERICAN PUBLIC HEALTH ASSOCIATION

1790 Broadway - - - - - New York 19, N. Y.

FOR DOCTORS, NURSES, PUBLIC OFFICIALS
A TRULY INVALUABLE BOOK!

BURN

Recent Advances in Public Health

TWO decades of progress in preventive medicine as it relates to the individual and to his community are here summarized. The book is arranged in three main parts—Public Health and the Individual, Public Health and the Community and Public Health and the Environment. Some of the subjects treated are Public Health Nursing, Care of Handicapped Children, Welfare of the Aged, Poverty, Vaccination Methods, Verminous Infestation, Water Purification, Smokeless Air and Refuse Disposal. A compact, handy volume which covers the field up to the present—will prove to be an invaluable aid in solving and understanding today's Public Health problems.

$6.75

THE BLAKISTON COMPANY
1012 Walnut Street, Philadelphia 5, Pa.

Please send Burn's Recent Advances in Public Health; my check is enclosed — charge my account —. It is understood that you will credit my account in full for the book if I wish to return it within 10 days.

NAME..... ADDRESS.....

CITY..... ZONE..... STATE.....

AJPH 4-49

New

FUNDAMENTALS OF HEALTH AND SAFETY

MUELLER and ROBERTSON

This new high school text reaches out directly to the student. The style is personal. Here is information in straight-forward language about the most fascinating person in the world to the student—himself.

Health and Safety is short. It can be completely covered in the time usually allotted the student. For all its brevity, the book includes every essential of health education needed by the average course.

The authors are practical people. Grover Mueller is Philadelphia's Director of Physical and Health Education, and also teaches at Teachers College, Temple University. Dr. Elizabeth Chant Robertson, former Fellow in Hygiene at The Johns Hopkins University, is now in the Department of Paediatrics, University of Toronto. The text, therefore, combines the viewpoints of public school and hospital, teacher and physician.

Illustrations and diagrams are ample. End-of-chapter material is rich. 343 pages—$2.40

If you are changing texts, please let us know.

VAN NOSTRAND
250 FOURTH AVENUE, NEW YORK 3

SANITARY ENGINEERING BACKGROUND

The **QUEST** *for* **PURE WATER**

by

M. N. BAKER

Here, at long last, is a comprehensive history of water purification from the earliest records to the twentieth century, relived and recorded by M. N. Baker following his retirement as Associate Editor of *Engineering News Record* in 1932. Here, as Abel Wolman says in his foreword, is "an inexhaustible treasury of authenticated information," which no student of sanitary engineering can afford to miss.

The product of nine full years of research after forty-five years of first-hand observation, Mr. Baker's story of man's 4,000-year "Quest" for a pure supply of drinking water is a must, not only for your library but for your reading list. Implementing his text with 73 illustrations from the history of water treatment, the author has also provided an invaluable documentation of 900 references in a separate bibliography.

527 pp. $5.00

Order from:

BOOK DEPARTMENT
American Water Works Association
500 Fifth Avenue, New York 18, N. Y.

FINE NEW EDITION NOW READY

New 9th Edition

New Authorship

ZINSSER'S

TEXTBOOK *of* BACTERIOLOGY

(formerly Hiss, Zinsser and Bayne-Jones)

By

David T. Smith, M.D., Professor of Bacteriology and Assoc. Prof. of Medicine and
Donald S. Martin, M.D., M.P.H., Prof. of Prev. Med. and P.H., and Assoc. Prof. of Bacteriology

With

Norman F. Conant, Ph.D., Professor of Mycology and Assoc. Prof. of Bacteriology
Grant Taylor, M.D., Assoc. Prof. of Bacteriology and Assoc. Prof. of Pediatrics
Joseph W. Beard, M.D., Professor of Surgery in Charge of Experimental Surgery
Henry I. Kohn, M.D., Assoc. Professor of Physiology and Pharmacology
Mary A. Poston, M.A., Instructor in Bacteriology

All from Duke University School of Medicine

FUNDAMENTALS, TECHNICS, PRACTICAL APPLICATIONS

In its first revision in 9 years this famous text has been extensively rewritten and wholly revised to bring it right down to date as a modern presentation of the fundamentals and technics of bacteriology, mycology and immunology. Includes the biological characteristics and the reactions of living tissues to the bacteria and their products with bold face type used to emphasize the important biological and cultural characteristics.

The new authors functioning as a research-teaching-clinical team have incorporated a great deal of the published and unpublished knowledge developed during the scientifically profitable war and post-war years.

The discussion of the sulfonamides has been expanded and a section on antibiotics added. An important new chapter discusses pleuro-pneumonia-like organisms.

One hundred eighty-two new illustrations have been added, including many electron micrographs, to illustrate submicroscopic morphological details of bacteria and viruses.

Published August 1948.

9th Edition. Rewritten, Revised and Reset. 1032 pages. 264 illus. $10.00

Order through local stores or

APPLETON-CENTURY-CROFTS, Inc.

35 W. 32nd St., New York 1, N. Y.

Presenting the

W&T RESIDUAL CHLORINE RECORDER

Culminating 35 years' leadership in chlorination, W&T now offers the Amperometric Residual Chlorine Recorder to water works operators desiring the finest in chlorination control. For the first time, it is possible to actually SEE what you're doing.

WHAT THE RECORDER DOES: It provides a continuous, permanent record of actual chlorine residuals—either free available or total.

WHAT IT IS: The Recorder consists of a cell and a recording mechanism attractively housed in a handsome, gray enameled pedestal to complement any W&T Chlorinator installation. Optional accessories include a *Remote* Residual Indicator and a *Remote* Alarm System.

HOW THE RECORDER WORKS: In a continuous sample of the water under test, a function of the residual is measured and subsequently recorded on a 24 hour circular chart in terms of ppm of residual chlorine.

ADVANTAGES OF RESIDUAL RECORDING: Residual recording includes these big advantages—(1) Better chlorination control (2) A permanent record of performance (3) A check on operating irregularities (4) Determination of chlorine demand (5) To ascertain residuals in the distribution system (6) As a check on chlorine usage to avoid wastage, and (7) Because the record is continuous, operating data is available which could not be obtained by periodic testing.

WHAT USERS SAY: Many installations of this Recorder are in successful operation. Here's what some users say—

"—The recorder enables us to save many dollars on chlorine—"

"—This instrument functions with extreme accuracy and fidelity. It provides something that experienced water plant operators have long desired—"

"—I congratulate Wallace & Tiernan on the development of this useful equipment which is probably the most important advance in the science of chlorination in the last twenty years—"

WRITE TODAY FOR FREE CATALOGUE TP-59-C GIVING COMPLETE DETAILS ON THE W&T RESIDUAL CHLORINE RECORDER

WALLACE & TIERNAN
COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

8-56

American Journal of Public Health
and THE NATION'S HEALTH

Volume 39 April, 1949 Number 4

The Health Educator's Bookshelf*

GEORGE ROSEN, M.D., PH.D.

Director, Bureau of Public Health Education, Department of Health, New York, N. Y.

Books are to be called for and supplied on the assumption that the process of reading is not a half-sleep, but in the highest sense an exercise, a gymnastic struggle; that the reader is to do something for himself.—WALT WHITMAN

Those who have read of everything are thought to understand everything too; but it is not always so—reading furnishes the mind only with materials of knowledge; it is thinking that makes what is read ours.—JOHN LOCKE

MAY I begin by pointing out that the brevity of the title of this article is not to be taken as indicative of the length of the health educator's bookshelf. Despite William Hazlitt's diatribe "On the Ignorance of the Learned," most of us would agree certainly that the acquisition of knowledge through books does not make men ignorant. Indeed, others among us may even go further and with pleasurable recollection echo Petrarch's comment that each book "also suggests the name of others, and one begets the desire of the others."

Then, too, the problems that engage our attention change with time, and they change not at random but for the most part in relation to the altering demands of the world in which we live. If an article such as this had been prepared a generation or so ago its compass and emphases would in all probability have been quite different. And the contrast is greater still when we look at the "suggestions for forming sanitary libraries" appended to the *Shattuck Report* of 1850. Only some five or six of the titles listed can be credited to health education. Today the edifice of public health is so vast and so elaborate that in surveying the literature of health education we must of necessity content ourselves with exploring only selected chambers of this imposing structure.

Finally, it should be obvious that no matter what the field of endeavor the act of selection is a form of self-expression and therefore subject to those differences that arise from variations of personality. After all, if there were no difference of opinion, there would be no horse race. And so to the heart of the matter.

* Special Review Article prepared at the request of the Editorial Board.

STAPLE FARE AND BASIC BOOKS

A bookshelf like a diet should be well balanced. To carry the dietary analogy somewhat further, the bookshelf should have a group of books that, in a sense, will be its "basic seven." Or if the reader prefers an Oslerian approach, this basic group may be considered a *Bibliotheca Prima*. These are the books to which the health educator may turn for standard knowledge and not be disappointed.

For the health educator a question of primary importance is: How can the health worker get the desired message over to the public? The answer, more than likely, is to be found in Ira V. Hiscock: *Ways to Community Health Organization* (3rd ed.), New York, Commonwealth Fund, 1939. This practical volume based on the experience of a number of official and voluntary health agencies, both urban and rural, in various parts of the country offers devices and techniques that have proved effective in teaching the public to understand community health problems. It is profusely illustrated with actual materials. A good alternative selection which is also eminently practical in approach is W. W. Bauer and T. G. Hull: *Health Education of the Public* (2nd ed.), Philadelphia, Saunders, 1942. This volume is likewise well illustrated.

In the field of public health it is now recognized that no matter how adequate the programs of official agencies may be, these must go hand in hand with the organized effort of the community. There is no standard pattern that can be offered to all communities, but some ways in which programs can be developed may be seen in *Community Organization for Health Education*. The report of a committee of the Public Health Education Section and the Health Officers Section of the American Public Health Association, Cambridge, Mass., Technology Press, 1941.

This brings us naturally to the subject of what is needed by any community in the way of public health organization. Here the health educator may turn to any one of several excellent guides. Based upon more than two decades of experience as a health officer and teacher, Harry S. Mustard has prepared a number of books on this topic. *An Introduction to Public Health* (2nd ed.), New York, Macmillan, 1944, offers an instructive and pleasant presentation. The same author's *Government in Public Health*, New York, Commonwealth Fund, 1945, is a concise guide to the development and present state of public health organization in the United States, and effectively supplements the volume previously mentioned. An alternative choice which offers a more detailed presentation is Wilson G. Smillie: *Public Health Administration in the United States* (3rd ed.), New York, Macmillan, 1947. Finally, still another standard handbook of public health organization and practice is that edited by Ira V. Hiscock: *Community Health Organization* (3rd ed.), New York, Commonwealth Fund, 1939. A fourth edition scheduled to appear in 1949 is now in preparation.

In part, at least, it is the health educator's purpose to *inform* individuals and groups about the promotion of health and the prevention of disease. To do so, the educator must have available sources of information that are reliable. First and foremost as a standard work is the encyclopedic volume by Milton J. Rosenau: *Preventive Medicine and Hygiene* (6th ed), New York, Appleton-Century, 1935. With it, the health educator should have one good medical text, for instance, Henry A. Christian: *Osler's Principles and Practice of Medicine* (16th ed.), New York, Appleton-Century, 1947, or Russell L. Cecil: *Textbook of Medicine* (7th ed.), Philadelphia, Saunders, 1947. For in-

formation on infancy and childhood, Holt's *Diseases of Infancy and Childhood* (11th ed.), New York, Appleton-Century, 1939, is a standard reference. Two publications will, in most instances, supply whatever guidance is needed on communicable diseases. These are *The Control of Communicable Diseases,* an Official Report of the American Public Health Association (6th ed.), New York, A.P.H.A., 1945 (now being revised), and Gaylord W. Anderson and Margaret Arnstein: *Communicable Disease Control* (2nd ed.), New York, Macmillan, 1948.

MIND, BEHAVIOR AND HEALTH

If the health educator's job were only to inform people, an adequate performance could be achieved with the books mentioned above. But health education is more than just a matter of informing individuals or groups of people; it must be concerned equally if not more with motivating them. Until recently, health education was characterized alone by an eager didactic impulse to make the results of medical knowledge available to the public, to enlighten the people in matters of health and hygiene. Basic to these efforts was an explicit or implicit acceptance of the supreme social value of intelligence, and a realization that social intelligence could be made effective only if there was an informed public opinion. This standpoint derived from the enlightenment of the 18th century and was based upon an associationist, rationalistic psychology.

But even the 18th century was aware that man did not act by reason alone. Voltaire, for instance, characterized as insane the "idea of becoming wholly reasonable." With the rise of dynamic psychologies and the development of the social sciences in our century, the basis of health education could not remain unaffected. An increasing realization that the perceptions, in terms of which people act, reach their consciousness through the dark waters of their emotions and beliefs, will gradually lead to a reorientation of health education.

In approaching the question: What makes people act as they do? the health educator will do well to have on the bookshelf the writings of Sigmund Freud and Adolf Meyer. Selections from the works of these *Altmeister* of dynamic psychology are now readily accessible in *The Basic Writings of Sigmund Freud,* New York, Modern Library, 1938, and *The Commonsense Psychiatry of Dr. Adolf Meyer,* New York, McGraw-Hill, 1948. With these may be read Arnold Gesell: *The Embryology of Behavior,* New York, Harper, 1945, where an effort is made to deal from the viewpoint of embryology with that most complex of all action systems, namely, human behavior.

Recently the achievements of the social sciences during the war have begun to appear in book form. The first of these reports, a landmark in the history of applied social science, is Alexander H. Leighton's *The Governing of Men,* Princeton, Princeton University Press, 1945. Dr. Leighton, a psychiatrist who had studied Navajo and Eskimo societies, was sent in June, 1942, to the Relocation Camp for evacuated Japanese at Poston, Ariz., by the Office of Indian Affairs, which ran it. Two-thirds of Leighton's book chronicles the first year of life at Poston from the point of view of the applied social scientist. The remaining third of the book generalizes the experiences at Poston. In numbered principles and recommendations the author gives what seem to be the most effective ways of dealing with groups of people living under stress. It seems almost obvious that these recommendations should be applicable to all situations requiring the organization of people. While human relations do not lend themselves

to precise blueprinting, this is *must* reading for health educators.

Another focus of interest in the social sciences which has particular relevance for health education is the *small group*. The most important studies of group structure with many implications for the future development of education have been conducted by the late Kurt Lewin and his associates. These studies show uncommon sensitivity in the interconnections between individual behavior and group structure. A collection of papers issued under the title *Resolving Social Conflicts*, New York, Harper, 1948, will serve the health educator as a convenient sourcebook in Lewin's social psychology. While at the Massachusetts Institute of Technology, Lewin established the Research Center for Group Dynamics, which he conceived as a laboratory to develop a combination of research and application in action. For current ongoing investigation in this field, see the journal *Human Relations* (published by the Research Center for Group Dynamics, Cambridge, Mass.). A pamphlet entitled *Two Lessons of Group Dynamics*, published by Educator's Washington Dispatch, Washington, D. C., indicates an immediate practical application of results from this field of investigation. It is likewise worth noting that a series of bulletins on group dynamics is being published by the N.E.A. Department of Adult Education, 1201 Sixteenth Street, Washington 6, D. C.

Important developments have occurred in the analysis of communication and the formation of public opinion. As communication analysis moves in the only direction which will interest the health educator, namely, the study of the effects of communication on behavior, it will be necessary for the health educator to be aware of the pertinent literature in this field. Promising results have already been obtained in Robert K. Merton's *Mass Persuasion*, New York, Harper, 1946. The most valuable synthesis of the various methods of public opinion analysis has been produced by Paul Lazarsfeld, B. Berelson, and H. Gaudet in *The People's Choice*, New York, Duell, Sloan & Pearce, 1946. Two important phenomena uncovered by this study were the effectiveness of the small group as over against mass media, and the significant role of the opinion leader, namely, the person who influences opinion in direct personal contacts. Another important study dealing with the nature and significance of the informal group in factories and the emergence of "natural leaders" is F. L. Roethlisberger and W. L. Dickson: *Management and the Worker*, Cambridge, Mass., Harvard University Press, 1938.

Two collaborative volumes surveying the problems of communication will be of interest to health educators. These are Lyman Bryson (editor): *The Communication of Ideas*, New York, Harper, 1948, and Wilbur Schramm (editor): *Communications in Modern Society*, Urbana, Ill., University of Illinois Press, 1948.

For a basic concept of communication the health educator would do well to read and study the work of a pioneer philosopher of communication, George H. Mead: *Mind, Self, Society*, Chicago, University of Chicago Press, 1934. This is not easy reading, but the result is worth the effort. In this connection the philosophically interested educator may wish also to read Sir Charles Sherrington's *Man on His Nature*, New York, Macmillan, 1941.

The relevance of the social group for education is illuminated by Allison Davis's *Social Class Influences Upon Learning*, Cambridge, Mass., Harvard University Press, 1948.

Finally, as a guide and reference work to the field of communication, the health educator will want to have on the bookshelf H. D. Lasswell, R. D. Casey, and

B. L. Smith: *Propaganda and Promotional Activities. An Annotated Bibliography,* Minneapolis, University of Minnesota Press, 1935, and B. L. Smith, H. D. Lasswell, and R. D. Casey: *Propaganda, Communication and Public Opinion. A Comprehensive Reference Guide,* Princeton, Princeton University Press, 1946.

The effects on health education of advances in the social sciences are still meager, but there are indications that the impact is already beginning to make itself felt. Here too the needs of the war period exerted a facilitative influence. Food had to be rationed and so the problem of food habits was tackled. *The Problem of Changing Food Habits. Report of the Committee on Food Habits, 1941–1943* (Bull. Nat. Res. Council No. 108), Washington, D. C., National Research Council, 1943, presents some of the work that was done in this field and is required reading for every health educator. A second significant publication is *Motivation in Health Education. The 1947 Health Education Conference of the New York Academy of Medicine,* New York, Columbia University Press, 1948. From the four papers contained in this small book it is clear that we will not have an effective theory of health education until it is recognized that for the most part people use intelligence to attain ends dictated by feeling and conviction and not as a matter of rational motivation, and that more often than not this is the situation with respect to health.

THE TOOLS OF HEALTH EDUCATION

In the preceding section we have dealt with ideas and concepts, or more generally with theory relevant to health education. But theory without practice is of little earthly use, and so we shall now consider the tools of the health educator.

First come such works of reference as an unabridged Webster's *Dictionary,* or some other, such as the new *American College Dictionary;* Dorland's *American Illustrated Medical Dictionary* (21st ed.), Philadelphia, Saunders, 1947; *The World Almanac* for 1949; and an encyclopedia. If there is room and money for the *Encyclopedia Brittanica,* well and good. If not, the one-volume *Columbia Encyclopedia,* New York, Columbia University Press, will be found exceedingly useful.

For the literary side of the health educator's endeavors *A Manual of Style,* Chicago, University of Chicago Press, 1937 (8th impression, 1945), is essential. It helps in the preparation of printed or written materials and is a standard working tool in proofreading and editing. In addition, for those who apply something more than just the tape measure of utility, I should like to recommend a volume that has been for me both profitable and amusing, namely, Robert Graves and Alan Hodge: *The Reader Over Your Shoulder. A Handbook for Writers of English Prose,* New York, Macmillan, 1944. Two items that may be of interest in this connection are Sir Clifford Allbutt: *Notes on the Composition of Scientific Papers,* London, Macmillan, 1925, and G. H. F. Nuttall: *Notes on the Preparation of Papers for Publication in The Journal of Hygiene and Parasitology,* Cambridge, at the University Press, 1940. Particularly for biological and medical terms the health educator will find it helpful to have E. C. Jaeger: *A Source-Book of Biological Names and Terms,* Springfield, Ill., Thomas, 1944.

The proper handling of publicity and public relations requires guidance. Jack Ramsberger: *How To Make Publicity Work,* New York, Reynal & Hitchcock, 1948, is a good introduction to publicity methods. Although written specifically for nurses, the *A.N.A. Public Relations Workshop,* New York, American Nurses Association, 1948, a

practical manual of public relations techniques, will be found useful for a wider audience. Brief and breezy, *About Public Relations, Publicity* is an excellent orientation manual on these subjects. Prepared by the Public Information Unit of the New York City Health Department, it will be of interest to all health educators. A good discussion of policies and techniques involved in presenting news to the public is offered in *Publicity in New York City*, a special issue of *Better Times*, a social work weekly. (This is available from the New York City Welfare Council, 44 East 23rd Street, New York 10.)

For the preparation of annual reports, a copy of B. K. Tolleris: *Annual Reports—How To Plan and Write Them*, New York, National Publicity Council (130 East 22nd St., New York 10), 1946, will guide the tyro. With this, it will be useful to have on hand Rudolph Flesch: *The Art of Plain Talk*, New York, Harper, 1946.

Intelligent use of radio and film is important to the success of health education programs. A good introduction to radio is offered by Erik Barnouw: *Handbook of Radio Writing*, Boston, Heath, 1948. The value of films makes it necessary for the health educator to know about the sources from which health films can be obtained. The Educational Film Library Association, 1600 Broadway, New York 19, publishes a *Health Film Catalog* which lists and analyzes about 250 films, indicating their sources. Then there is the Library of Congress *Guide to United States Government Motion Pictures*, 1947, which also contains health materials. The National Film Board of Canada publishes a *Public Health Film Survey* which includes about 130 health films and another survey for approximately 300 medical films. These surveys may be obtained from the National Film Society, 172 Willington Street, Ottawa, Canada. In addition, various other organizations have larger or smaller catalogs. For example, the Health and Welfare Division of the Metropolitan Life Insurance Company, 1 Madison Avenue, New York, has brought out a *Catalog of Films on Health and Safety*, listing films and film strips which this organization produces and distributes. See also the Bibliography of Public Health Motion Pictures and Film Strips. *A.J.P.H.*, February, 1949, page 236.

The television field is still wide open, but the health educator ought to have at least one volume on the desk, and this might well be Hayland Bettinger: *Television Techniques*. Edgar Dale: *Audio-Visual Methods in Teaching*, is also recommended for its field.

Art techniques will, from time to time, be of interest to the health educator. One of the best bibliographies to this field is contained in *Parergon Supplement*, Evansville, Ind., Mead Johnson & Co., 1946. Should a single reference volume be desired, Ralph Mayer: *The Artists' Handbook of Materials and Techniques*, New York, Viking Press, 1943, may be recommended.

A volume by a master typographer which will be found very useful is W. A. Dwiggins: *Layout in Advertising*, New York, Harper, 1928. A new edition has been in preparation and will shortly be available.

For general reference, the bookshelf should have the *How-To-Do-It Series on Publicity and Public Relations Techniques*, National Publicity Council, 130 East 22nd Street, New York 10. Equally useful is the *Publicity Directory*, 1947, Special Issue of *Channels*, National Publicity Council for Health and Welfare Services, New York.

Finally, as an example of how techniques are put to work, one should have H. C. Baker and M. S. Routzahn: *How To Interpret Social Welfare*, New York, Russell Sage Foundation, 1947.

BOOKS FOR SPECIAL FIELDS

The impossibility of becoming omniscient makes it imperative that the health educator have on the bookshelf a number of books to which one can turn for rapid orientation. These should include at least the following: H. D. Pope and A. S. Chadwick: *The Modern Attack on Tuberculosis* (rev. ed.), New York, Commonwealth Fund, 1946; R. A. Vonderlehr and J. R. Heller, Jr.: *The Control of Venereal Disease,* New York, Reynal and Hitchcock, 1946; W. M. Gafafer (editor): *Manual of Industrial Hygiene,* Philadelphia, Saunders, 1943; and *Manual of Public Health Nursing* (3rd ed.), New York, Macmillan, 1939. As a guide to child care, Benjamin Spock: *Pocket Book of Baby and Child Care,* New York, Pocket Books, 1946, is cheap and has a down-to-earth viewpoint. One of the most practical guides for the first two years of life is *New York City's Baby Book. A Handbook for Parents,* New York, Department of Health, 1947. The three publications of the Children's Bureau, *Infant Care, Your Child from One to Six,* and *Your Child from Six to Twelve,* are similarly comprehensive and authoritative and ought to be readily available. Should the health educator need information on public health law, the book to consult, of course, is J. A. Tobey: *Public Health Law* (3rd ed.), New York, Commonwealth Fund, 1947. In the area of environmental sanitation, two volumes will give aid and comfort in time of need—H. S. Adams: *Milk and Food Sanitation Practice,* New York, Commonwealth Fund, 1947, and V. M. Ehlers and E. W. Steel: *Municipal and Rural Sanitation,* New York, McGraw-Hill, 1943. When vital statistics are required, two items will fill the bill in most respects. For the first four decades of the century the volume by F. E. Linder and R. D. Grove: *Vital Statistics Rates in the United States, 1900–1940,* Washington, D. C., Government Printing Office, 1943, and the *Physicians' Handbook on Birth and Death Registration* (9th ed.), Washington, D. C., Census Bureau, 1943, are most useful. Among the newer trends in the medical and public health fields, the background and objectives of social medicine are well presented in the collaborative volume *Social Medicine: Its Derivations and Objectives,* New York, Commonwealth Fund, 1949. In the area of rural health an excellent contribution has appeared, namely, F. D. Mott and M. I. Roemer: *Rural Health and Medical Care,* New York, McGraw-Hill, 1948; and for information in the dental field the health educator can now turn to Wisan and Pelton: *Dentistry in Public Health,* Philadelphia, Saunders, 1949. There is already an enormous literature on medical care so that no single volume alone suffices. Nevertheless the health educator as a citizen and by the very nature of his field of activity should be acquainted with the basic problems. A very useful statistical reference work is H. Hollingsworth, M. C. Klem, and A. M. Baney: *Medical Care and Costs in Relation to Family Income, A Statistical Source Book,* Federal Security Agency, Social Security Administration, Bureau Memorandum No. 51 (2nd ed.), 1947. A good recent effort to present the development and present state of public medical services is Franz Goldman: *Public Medical Care—Principles and Problems,* New York, Columbia University Press, 1945. See also his *Voluntary Medical Care Insurance in the United States,* New York, Columbia University Press, 1948. The New York Academy of Medicine report, *Medicine in the Changing Order,* New York, Commonwealth Fund, 1947, is another volume worth reading. The best statement of the fundamental issues involved in the medical care discussion is, in my opinion, still that of Walton H. Hamilton in *Medical Care for the American People.*

The Final Report of the Committee on the Costs of Medical Care, Chicago, University of Chicago Press, 1932. C. T. Brues: *Insects and Human Welfare* (rev. ed.), Cambridge, Mass., Harvard University Press, 1947, gives a satisfactory basic account of the public health aspects of insect-borne diseases. Unfortunately a day has only twenty-four hours, so that books which survey the highlights of a particular field and thus save time deserve a debt of gratitude, particularly when they are well done. A volume of this kind, which has been appearing since 1943, is the *Health Instruction Yearbook* compiled by Oliver E. Byrd, Stanford, Calif., Stanford University Press. The most recent issue is that for 1948. A similarly useful British volume is Baron Horder (editor): *Health and Social Welfare, 1947,* London, Todd Publishing Company, Ltd.

PERIODICALS ON THE BOOKSHELF

Current periodicals are an absolute necessity in order to keep abreast of any field of public health. For the health educator the *American Journal of Public Health, Hygeia, Science News Letter, Channels, Public Health Economics,* and *Public Opinion Quarterly* represent a minimum selection. Special needs may require other periodicals, perhaps *Population Index, Public Health Reports, Public Health Nursing, Bulletin of the National Tuberculosis Association, Cancer News* of the American Cancer Society, the *Industrial Hygiene Newsletter* of the U. S. Public Health Service, as well as its *Venereal Disease Information,* or *The Child* published by the Children's Bureau. The publications of various municipal and state health departments will be of interest at some time or other. *The Statistical Bulletin* issued by the Metropolitan Life Insurance Company is a useful source of information, as are also the *Tuberculosis Abstracts* of the National Tuberculosis Association. House organs and other publications of pharmaceutical houses will also be found to have items of health education interest. While not itself a periodical, the 35 year *Index of the American Journal of Public Health, 1911–1945,* Garrard Press, 1947, is a necessity. Finally, the health educator should be aware of *Tone,* the newsletter of the Cleveland Health Museum.

HISTORY, HUMANISM AND PUBLIC HEALTH

Public health is a field of human activity which owes its existence to the social and biological nature of man. A gregarious instinct and need for protection undoubtedly encouraged men to join together and live in communities. But man is also a biological organism and as such subject to biological needs and processes that are attributes of life. With the satisfaction of these needs (nutrition, reproduction, shelter) and the manifestations of these processes (health and disease) the community has had to reckon throughout known history. These efforts of the past have all entered, in some fashion or other, into the broad stream of modern public health. For the health educator to understand how the present has evolved from the past, and to be aware of the position of the public health worker in our complex society, a knowledge of history is essential. As the late Justice Holmes once said, "Continuity with the past is a necessity, not a duty."

The health educator should have at least one general history of medicine on the bookshelf. Several one-volume histories are available, but my personal preference is for Arturo Castiglioni: *A History of Medicine* (2nd ed.), New York, Alfred A. Knopf, 1947. If available, Fielding H. Garrison: *An Introduction to the History of Medicine* (4th ed.), Philadelphia, Saunders, 1929, should, of course, be consulted. However, Garrison is out of print, and the

prices of second-hand bookdealers are excessively high, so don't buy it unless you are a collector or especially interested in medical history. Furthermore, the health educator ought to be aware that no history is completely free of error; for specific points it is well to check several historians or to return to the original source, if it is accessible.

Either of these volumes should be flanked by Henry E. Sigerist: *Civilization and Disease,* Ithaca, N. Y., Cornell University Press, 1943, a book which offers a fascinating panoramic view by a master historian, and R. H. Shryock: *The Development of Modern Medicine,* New York, Knopf, 1947, which undertakes to portray the rise of modern medicine and public health against the background of intellectual and social history in general. A useful supplement to Shryock, presented with the accuracy and clarity characteristic of the author is Iago Galdston: *Progress in Medicine,* New York, Knopf, 1940.

Turning more specifically to the history of public health, one must be honest and say that while several books can be suggested there is no single volume offering a competent historical account of public health. There are of course the two volumes by Sir Arthur Newsholme: *Evolution of Preventive Medicine,* Baltimore, Williams & Wilkins, 1927, and *The Story of Modern Preventive Medicine,* Baltimore, Williams & Wilkins, 1929, but with all due respect to Newsholme as a health officer, teacher, and thinker, as a historian his approach is primitive. History ought to be a recreation of the changes exhibited in time and space of certain forms of human behavior, with some indication of the web of interconnection which binds together different facts and various lines of development. Nevertheless, as sources of factual data, the Newsholme volumes have a limited usefulness.

For the reader who wishes a history of sanitation that can be read with *pleasure,* I unreservedly recommend Reginald Reynolds: *Cleanliness and Godliness,* New York, Doubleday, 1946. Reynolds offers complete coverage from the water closets of Crete and Mohenjo-Daro to the latest developments of modern sanitary engineering, all in vivid, urbane prose.

The historical side of health education, with particular reference to health museums, is presented by Bruno Gebhard: "From Medicine Show to Health Museum, *Ciba Symposia,* March, 1947. Parenthetically, the health educator will find much of interest in the various issues of *Ciba Symposia* (published by Ciba Pharmaceutical Products, Summit, N. J.), now in its tenth year.

Public health administration and epidemiology have been well served by C.-E. A. Winslow whose *Evolution and Significance of the Modern Public Health Campaign,* New Haven, Conn., Yale University Press, 1923, and *Conquest of Epidemic Disease,* Princeton, Princeton University Press, 1943, deserve a place on the bookshelf where they may easily be reached.

The history of public health in America is still to be written, but meanwhile M. P. Ravenel (editor): *A Half Century of Public Health,* New York, American Public Health Association, 1921, serves to orient one.

The history of occupational hygiene has been a neglected field, but within recent years historical accounts of this field have begun to appear. Ludwig Teleky: *History of Factory and Mine Hygiene,* New York, Columbia University Press, 1948, provides an adequate introduction. For the history of an occupational group whose lineage may be traced back in almost unbroken continuity to neolithic times, the health educator should see George Rosen: *The History of Miners' Diseases,* New York, Henry Schuman, 1943.

In 1939, Morris Cohen, the philosopher, noted in his diary: "How marvel-

ous it is to pick up an old book and feel that you are communicating with a man who has long passed away, that you are getting at his mind, his feelings, and way of expressing himself! " This sense of continuity with the past requires one or several classics of public health on the bookshelf. Most easily available, of course, are those recently reprinted. Among these are John Graunt: *Natural and Political Observations made upon the Bills of Mortality,* Baltimore, Johns Hopkins Press, 1939; Snow *On Cholera,* New York, Commonwealth Fund, 1936; William Budd: *Typhoid Fever,* New York, A.P.H.A., 1931; and the *Shattuck Report,* Cambridge, Mass., Harvard University Press, 1948. *Papers of Charles V. Chapin, M.D.,* New York, Commonwealth Fund, 1934, may be classed in the same group.

Reference to John Graunt in the preceding paragraph brings to mind Major Greenwood with whose writings every public health worker should be acquainted. In this connection his *Medical Statistics from Graunt to Farr,* Cambridge, at the University Press, 1948, and *Epidemics and Crowd Diseases,* New York, Macmillan, 1935, are recommended.

Many of the achievements of modern public health are brought home to us most vividly when we read the biography or autobiography of the person who made the contribution. A section of the health educator's bookshelf should therefore be reserved for biography. As an introductory volume comprising selections from autobiographies, the book prepared by the present writer in collaboration with B. Caspari-Rosen: *400 Years of a Doctor's Life,* New York, Henry Schuman, 1947, may be suggested. Outstanding public health biographies are C.-E. A. Winslow: *The Life of Hermann M. Biggs,* Philadelphia, Lea and Febiger, 1929; S. Josephine Baker: *Fighting for Life,* New York, Macmillan, 1939; Hans Zinsser: *As I Remember Him,* Boston, Little, Brown, 1940; Alice Hamilton: *Exploring the Dangerous Trades,* Boston, Little, Brown, 1943; Ronald Ross: *Memoirs,* London, John Murray, 1923; and Sir Arthur Newsholme: *Fifty Years in Public Health;* London, George Allen and Unwin, 1935. The interested reader will find others. For the autobiography of one of the fathers of public health see the " Biography of Dr. Johann Peter Frank—written by himself, *J. Hist. Med.* 3:11–46, 279–314, 1948.

Many are the rivulets that feed the stream of public health—history, science, literature, and the humanities—but unfortunately neither time nor space will permit us to trace the contribution of each to the literature of the health worker. In conclusion, I wish only to refer the health educator to certain modern books that have had a seminal influence on our views of human behavior and culture. Among these I would include Ruth Benedict: *Patterns of Culture,* Boston, Houghton Mifflin, 1934 (there is also a cheap pocket edition); Lewis Mumford: *Technics and Civilization,* New York, Harcourt, Brace and Company, 1934; and *The Culture of Cities,* New York, Harcourt, Brace, 1938; Patrick Geddes: *Cities in Evolution,* London, 1915; Alfred N. Whitehead: *Science and the Modern World,* New York, Macmillan, 1925; and John Dewey: *Human Nature and Conduct,* New York, Henry Holt, 1922.

Last of all, when the day's work is done and one is ready for relaxed reflection, there is no better companion than *The Practical Cogitator,* an anthology of world literature ranging from the Old Testament to Gertrude Stein, selected and edited by C. P. Curtis, Jr., and Ferris Greenslet, Boston, Houghton Mifflin, 1945. To read this book is a liberal education, for the editors subscribe to that basic tenet of humanism, which should be the motto for the health educator—Nothing human is foreign to me.

Some Public Health Problems in Nuclear Fission Operations*

ARTHUR E. GORMAN, F.A.P.H.A., AND ABEL WOLMAN, DR. ENG., F.A.P.H.A.

Sanitary Engineer and Consultant, Atomic Energy Commission, Washington, D. C.

THE development and expansion of any new industry is and properly should be a matter of prime interest and concern to public health officials at all levels of government and across the entire spectrum of public health specialties. When this new industry holds promise of such profound importance to the national defense, economic future, and public health and welfare as does the atomic energy industry, it is clearly obvious that its problems, in so far as they may affect the public health, should be placed squarely before responsible and qualified officials in that profession for their information and for whatever assistance they may be able to give in meeting these situations.

The purpose of this paper is to discuss from the point of view of the public health engineer and the industrial hygienist certain problems of environmental and industrial sanitation which exist in this new industry; to tell what is being done to resolve them, and to indicate what we see ahead in atomic energy development which properly concerns these public health specialists and presents them with a challenge, as well as an opportunity to serve.

In discussing this new industry with professional public health workers, it is important to record at the outset that, in spite of all the unique features peculiar to production and research in nuclear fission operations, a rational approach to a study and solution of the public health problems presented still rests on well established principles in sanitary engineering and industrial hygiene. In this respect, therefore, the competent and experienced public health worker has much to offer in helping to guide this new industry. He need not assume that his interest, concern, and responsibility in its problems should await the day when the "mystery of the atom" is common knowledge or when he is invited to participate in resolving its environmental problems. On the other hand, as his experience with situations involving nuclear fission operations broadens, he will find he is dealing with a science which has a profound impact on his profession but concerning which his customary tools of measurement and appraisal are of little value.

The administrative health officer will recognize at once that he is dealing with an industry where young men predominate. He will see scientists using instruments and equipment which seem to challenge the imagination as to refinement in assembly, speed and accuracy of action. He will note that they control production units comparable in size with some of the facilities used at heavy industrial plants.

The epidemiologist will find that the

* Read before a joint Session of the Engineering, Public Health Nursing, and Industrial Hygiene Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 11, 1948.

amount and period of radiation, instead of type and virulence of bacterial infections, are subjects of special significance and interest; the medical officer controlling the spread of communicable diseases will find his counterpart—the health physicist—insisting on proper shielding of personnel against radiation and decontamination of over-exposed areas; the bacteriologist will find ionization chambers and Geiger counters being used in place of culture media and incubators; the industrial hygienist will find a keen interest in determination of particle sizes in dust, primarily with respect to its radioactivity rather than with its chemical toxicity; the sanitary engineer will be intrigued by the number and size of the processing units which call for water supply, heat exchange, drainage, air conditioning and ventilation equipment; and he will want to know what becomes of the plant effluents and what, if any, contamination reaches the ground, the streams, and the atmosphere.

NATURE OF NUCLEAR FISSION OPERATIONS

To get back to the public health problems of the industry and an appraisal of them, perhaps a logical first step toward this objective would be to describe briefly nuclear fission operations as currently practised, since most people, even those in the technical professions, are not familiar with them, and relatively few have been able to visit the plants. In spite of its unique characteristics, the operations of this new industry follow a general pattern of other industries in many of its facilities and operating methods. As a consequence there is a definite parallelism in the problems it presents in waste disposal and environmental sanitation.

a. *Production*—Nuclear fission operations start as do other industrial operations with raw materials which must be refined. The principal one is uranium ore which must be crushed, sieved, and conditioned by a variety of processes before it is ready for exposure to neutron bombardment in a pile or reactor where new substances and energy resulting from nuclear fission are produced. In this preliminary processing, the usual problems exist in protecting workers from dust and fumes encountered in metallurgical and chemical industries. However, in this new industry exposure is more serious than in most industries because the natural ore is radioactive, although at relatively low levels. Some elements which must go into the structure of a pile call for various degrees of refinement and metallurgical operations, which involve hazards of dust and fumes.

The highly radioactive materials are produced after neutron bombardment of the prepared uranium in a "pile" or reactor. Here, as a result of nuclear fission, new products are created which are hazardous to handle because they emit particles of high energy which are damaging to living tissues. Operators must be shielded from these radiations, and this requires special design using abnormally thick lead and concrete walls.

The heat resulting from nuclear fission is tremendous and must of necessity be controlled, or considerable disintegration and possible destruction of the reactor structure itself would take place. In a reactor, this heat is dissipated by cooling, using air and water. These coolants, which are used in very large quantities, become radioactive. When they are disposed of they carry with them some radioactive waste products which are potentially hazardous and must therefore be subjected to special treatment.

After removal of the highly radioactive materials from a large production reactor, they must then be treated by various chemical and mechanical separations processes, common to many industries, to permit the particular ele-

ment which is to be produced—usually plutonium—to be obtained. Fission products which are also produced are recovered or stored depending on need for them.

A property of all radioactive substances is progressive decay through emission of energy. They may emit radioactive particles such as alphas, betas, and gamma radiations. Some idea of the rate of decay may be obtained from the fact that 1 gram of radium—equivalent to 1 curie—gives off 37 billion disintegrations per second.

The so-called half-life of a radioactive substance is the length of time required for one-half of its radioactive energy to decay. The half-life of radioactive elements may vary from a few seconds to a million years. Therefore, by a process of holding certain short half-life radioactive substances, the hazard of handling or exposure to them can be reduced. Provided its limitations are fully understood radiation decay through holding has preventive value. Its application might be compared to the health officers' use of quarantine for the period of incubation of a disease as a preventive measure.

As in other industrial chemical processes, there are wastes to be taken care of; and they too are highly radioactive. Those wastes which contain material of sufficient value for recovery are stored while those which, at the moment, have slight economic value are disposed of. Since all are radioactive and some highly toxic, the techniques of disposal must be carefully developed and constantly supervised.

b. *Research*—As contrasted with production plants in the atomic energy industry, there are many research laboratories. Some are small-scale units or production operated for development purposes. Others are for basic research and may handle only radioactive materials or isotopes produced at other plants and transported to these research centers. Since these materials are highly radioactive, great care must be taken in their handling and transportation, use and disposal; and the alert public health official has a responsibility to be sure that he is familiar with these operations and any potentialities which may exist by reason of them for exposure of the public or public facilities within the area of his jurisdiction.

c. *Radioisotopes*—As you may know the Atomic Energy Commission produces and sells radioactive isotopes of various kinds for use and research in medicine, biology, agriculture, and industry. In its *Fourth Semi-annual Report to the Congress*, the Commission lists 3,136 shipments of radioactive isotopes since July 1, 1946, distributed semiannually as follows:

DISTRIBUTION OF RADIOACTIVE ISOTOPES

	Number of Shipments
July 1 to Dec. 21, 1946	246
Jan. 1 to June 30, 1947	699
July 1 to Dec. 31, 1947	953
Jan. 1 to June 30, 1948	1,238
Total to June 30, 1948	3,136

From Oak Ridge, isotopes have been sent to users in 33 states, the District of Columbia, and Hawaii. Recipients were 236 institutions. By the end of June, 1948, 19 foreign nations had qualified to receive radioisotopes and to 15 of them a total of 159 shipments had been made.

Two isotopes — Phosphorus ^{32} and Iodine ^{131}—represent 2,024, or about 64.5 per cent of these shipments. Carbon ^{14} and Sodium ^{24} represent 367 shipments as an additional 10.5 per cent. Thus these four radioactive isotopes account for 75 per cent of the shipments made to date.

Classified by broad fields of professional application these isotope shipments were used as in Table 1.

The half-life of some of the more common isotopes currently used for research in medical, public health, industrial, and biological laboratories is listed (Table 2):

TABLE 1

Use in	Number of Shipments of Radioactive Isotopes July 1, 1946, to June 30, 1948
Medical Therapy	1,291
Animal Physiology	992
Chemistry	262
Physics	257
Plant Physiology	156
Industrial Research	90
Bacteriology	64
Metallurgy	20
Other	4
Total	3,136

TABLE 2

Element	Symbol	Mass No. of Isotope	Half Life
Carbon	C	14	5,100 yrs.
Zinc	Zn	65	280 days
Calcium	Ca	45	180 "
Sulphur	S	35	87.1 "
Iron	Fe	59	44 "
Phosphorus	P	32	14.3 "
Iodine	I	131	8.0 "
Copper	Cu	64	12.8 hrs.
Potassium	K	42	12.4 "

CONTROL MEASURES NECESSARY

The usual safety and public health control measures carried out by well managed industries and research institutions are not adequate for complete protection of persons and property in the production and use of nuclear fission materials. This is because of the new hazards introduced by radioactivity. It is a reason why those of us who have been accustomed to considering industrial and environmental problems in terms of chemical, bacterial, biological, and general physical properties must broaden the scope of our appraisal to include radioactivity. This calls for a better understanding of the principles of nuclear physics and familiarity with its technical terms, units, and standards, and also an ability to interpret them and to blend their values with others we are most accustomed to work with.

At plants operated under the Commission's control, measures for protection of working personnel against overexposure to radioactivity usually are carried out by skilled technicians called health physicists. They monitor working areas and see to it that any contamination which occurs is removed and properly disposed of. While their earlier attentions were directed principally to protection against radioactive contamination in-plant and on-site, more recently these specialists have given much consideration to the off-site problems involved when waste from nuclear fission operations for one reason or another are released to the atmosphere, into the ground, or on surface areas.

SANITARY ENGINEERING RESPONSIBILITIES

It is this environmental phase of the problem which is of special interest to the sanitary engineer and the industrial hygienist. Therefore, it is the one which we shall cover most fully in this paper. It is an area where the opportunity and challenge is the strongest and where, by reason of their education and training, the sanitary engineer and the industrial hygienist can be of special service. The sanitary engineer, the industrial hygienist, and the health physicist are indeed key men in the progress of this new industry. It has become almost axiomatic that an industry like a community can have a healthy growth only so long as it can adequately dispose of its own waste products. Because of nuclear fission we are actually on the threshold of a new era in industrial development; therefore, every public health worker should acquaint himself with the problems which this new industry will present, especially in disposal of its wastes.

The need of educating and training sanitary engineers and other public health specialists in nuclear physics and its applications in the expanding field of atomic energy is recognized by the Commission. A small group of sanitary engineers and chemists in federal agencies, other than the Commission, are being given training at Oak Ridge and Los Alamos; and it is planned to expand this activity to water and sewage

plant operators and public health officials. The need of extensive education and training of sanitary engineers and industrial hygienists in all categories of the profession and in private as well as public service in the elements and problems of this new industry is obvious. Programs designed to meet this need are under serious consideration; and, in the near future, a seminar will be held in Washington at which a selected group of key men, representing water and sewage works operators and state sanitary engineers, will be informed of current problems in the industry and will be requested to suggest effective ways of attack.

PROBLEMS OF WATER SUPPLY

Recognizing that the disposal of radioactive or toxic wastes from its plants or research operations in increasing quantities could create serious problems, the Atomic Energy Commission and its various area contractors have given and are continuing to give much consideration to reducing such contamination to an absolute minimum. But a water-cooled reactor requires a large volume of water for heat-exchange purpose, and this water must be disposed of. The type and degree of radioactivity in such water can be determined and controlled. Knowing the radioactive characteristics of the water leaving the reactor, the period of time it will continue to emit nuclear energy can be determined. Therefore, having knowledge of the amount of this energy in particles or radiations which the human system can tolerate with safety, it is possible to determine the extent of hazard involved in the disposal of such wastes.

As all radioactive substances undergo decay until they cease to emit energy, knowledge of the length of time required for this decay provides one method of appraising the extent of the problem. Consequently, retention is one method of treatment relied upon for cooling water which must be returned to streams. Unfortunately, some radioactive substances have long half-lives. In such cases, these substances must be removed from water used for cooling reactors unless their quantities are in such small amounts that, with dilution, the hazard of their presence is negligible. The technical control in treatment of water used for cooling nuclear reactors must be of the highest order. A healthy development of this industry would require application of the special skill and experience of the water works designers and specialists in water treatment.

At atomic energy plants, as well as those of other industries, there is always the remote possibility that an accident or a spill will occur with the result that the waste products in abnormal amounts might be released. Great care is taken to avoid such accidents, and provision is made for special treatment and use of standby equipment should they occur. Nevertheless, it should be the concern of every sanitary engineer responsible for water supplies in an area where nuclear fission products are produced or used to appraise and evaluate risks to such supplies under all circumstances. He should work out with operators of such plants a system of routine checks and emergency warnings so that at all times protection against radjoactive contamination will be afforded. The Commission will coöperate fully with the U. S. Public Health Service in its research program with the states and industry to resolve any problem of stream pollution which may result from its operations.

The discharge of radioactive waste products into or onto the ground also has potentialities of contaminating water supplies; and, here again, long known principles of disposal of wastes from industrial plants apply. Radioactive waste products with long half-lives could create serious hazards, and their discharge deserves careful study and

effective control. Where such wastes are disposed of to the soil, it is of basic importance that information be obtained as to the rate of flow of the ground water and the dilution possibilities so that at all times the extent and degree of contamination may be known. Fortunately, some radioactive substances are known to attach themselves firmly to soil and do not travel far from the point of disposal in soil. As a result, they undergo decay in a localized area and spend their radioactive energy before they can be transported to more distant sources of water supply. But this favorable relationship should not be accepted as adequate protection under all circumstances. Common prudence dictates that the facts in each case should be obtained where sources of water supply might be involved.

There is evidence that such processes of water purification as coagulation and sedimentation and sand filtration are quite effective in removing some radioactive substances from water. The problems of disposal of the radioactive sludge and controlling the build-up of radioactivity in filter media are deserving of special consideration. These are being studied by the Atomic Energy Commission, and facilities for extending research of this kind are being installed at Oak Ridge and Los Alamos.

Radioactive particles carried into the atmosphere by gaseous effluents from nuclear fission operations could contaminate the air we breathe and, on settling, with or without rainfalls, contaminate the soil and vegetation on which they deposit. Thus watersheds and open reservoirs could become contaminated if the half-life of the radioactive product is long. Here again, the elements of time and dilution, as well as fixation, are factors of safety. But an alert and responsible sanitary engineer should not accept these favorable influences as a substitute for determining the facts.

Still another aspect of radioactivity in water, interesting and significant to sanitary engineers and biologists, is evidence that such energy does not unfavorably affect many plankton growths, and is accumulated within these organisms. Algae and other forms are known to grow prolifically in water which is quite radioactive. The potentialities and significance of this finding are especially interesting and important to all interested in the biology of streams and their subsequent use as sources of industrial and public water supplies.

COMMUNITY WATER SUPPLIES

At Oak Ridge, Hanford, and Los Alamos, the Commission, through its contractors, operates communities, housing and serving about 60,000 persons, including employees and their families and, during period of expansion, construction camps for tens of thousands of temporary employees. The problem of supplying water to these areas has been much more involved than that of providing water for normal communities of the same size. This has been due partly to the fact that new communities had to be built hurriedly in remote areas and under difficult conditions.

At the Richland, Washington, Village, housing employees of the Hanford Works, the per capita consumption of water on hot days is about 1,100 gallons per day, over two-thirds of which is for sprinkling lawns and parkways. Currently, more than half of the water supplied to Los Alamos Village must be pumped on elevation of nearly 2,000 feet.

Private water works consulting engineers were employed to design these facilities, and have successfully resolved the problems involved.

PROBLEM OF WASTE DISPOSAL

Waste from nuclear fission plants as from most industries are liquid, dry, and gaseous. It is the policy of the Commission to develop ways and means of

treating wastes resulting from production and research activities at plants under its jurisdiction so that there will be no hazards to its employees or to others. Toward this end, special working groups of outside consultants are collaborating with staff employees in various areas of operation and at research institutions.

Liquid Wastes—Because of the scarcity of the raw material such as uranium ore and the value and importance of fission products resulting from the separations processing subsequent to bombardment in the reactors, great care is taken not to lose these products. This calls for on-site storage of large quantities of valuable and highly radioactive materials, especially at production plants. Waste products with little value but having radioactive or toxic properties must be disposed of. This poses a problem both of economics and of safety. Cribbing and lagooning, which are common practices in many industries, have been carried out with a fair measure of success, but it is recognized that such practices have potential hazards and limitations.

With the objective of maximum product recovery and minimum of radioactive waste to be disposed of, the Commission is seeking to develop processes which will in effect result in a closed system. One of the unique problems in the nuclear fission industry is that equipment and facilities which come in contact with highly radioactive contamination also become contaminated and, therefore, must be decontaminated or be disposed of. For this reason, use of many of the methods and much of the equipment common to other industries for treatment of industrial waste must be ruled out or modified because of the end problem of ultimate disposal. This need of developing equipment small in size and methods which will minimize human exposure is a complication which must be faced at all times in seeking practical solutions to problems of disposal of wastes in the field of nuclear fission.

The ability of certain natural soils and artificial media and resins to adsorb radioactive liquid wastes is a subject of much interest and research. The possibility of concentration of radioactivity by biological methods and, conversely, the effect of various amounts of radioactivity on biological processes common to sewage treatment are being studied.

There has been some concern on the part of operators of sewage treatment works that the disposal of waste resulting from the use of radioactive isotopes at hospitals and research institutions might have an adverse effect on the sensitive biological processes at these works. Their concern is wholly understandable and, currently, research programs are being initiated designed to obtain basic facts. The rapid increase in the use of radioactive isotopes in institutions and industry poses many other problems which call for answers such as the degree, if any, to which plumbing fixtures in buildings can become radioactive, and to what extent facilities in sewer systems, such as receiving basins, sump and booster pumps, will require monitoring before entered or handled by workmen.

Radioactivity is indeed a type of contamination to which the sanitary engineer and the industrial hygienist of the future will need to give serious consideration and which he must be able to measure and to interpret. Its potential as a contaminant in cases where interconnections between piping systems in buildings or institutions exist is as insidious as it is hazardous.

Dry Wastes—In the various processing stages, especially in metallurgy, dusts and chips of radioactive and, in some cases, toxic materials result. That which can be, is reclaimed. As a rule the remainder, if of a low level of radioactivity, is buried. If of high level, it is stored in a container—well shielded against radioactivity—for subsequent

burial when it is safe to do so in the ground, usually in the same container. Instruments, containers, glassware, and facilities used in handling radioactive materials become contaminated. They are decontaminated where this is possible or practical but ultimately they become radioactive to a degree where they must be condemned for further use. Again, depending on the degree of radioactivity, these activities are disposed of by burial either in shielded containers or direct. Incineration of radioactive materials is not advisable unless adequate facilities are available to remove all activity from the resulting gases, which in itself is not a simple task.

The entire problem of disposal of so-called dry wastes resulting from nuclear fission operations is receiving much attention. The usual salvage operations common to most industries cannot be resorted to and great care is taken to see that contaminated material having value is not released until it is safe to do so; and in the case of long-life radioactivity the facility is destroyed rather than risk possible re-use. As this industry expands, the temptation to reclaim value in contaminated material and equipment could introduce serious public health hazards which must be prevented.

Gaseous Wastes—Certain constituents of the air which are passed through an air-cooled reactor become radioactive. The concentration is low and the half-life short. Therefore, if operation is discontinued when atmospheric conditions are most unfavorable, it is possible by use of special air treatment equipment to meet with a high factor of safety permissible limit established for atmospheric contamination. As in most chemical processing — dry or in solution — very small particles in dust or mists are carried away through the ventilating systems. Those which are radioactive could create a hazard, especially if discharged to the atmosphere in such a way as subsequently to expose human beings or vegetation in amounts which would be injurious. Similarly, exhaust gases from hoods in experimental and research laboratories could, on a lesser scale, create local hazards. The Commission is keenly aware of this stack gas problem and has authorized the installation of most elaborate equipment for filtering and otherwise removing particles and gases from stack and hood effluents. In this field, as in that of liquid waste disposal, work is being pressed, under the direction of a special committee of consultants, looking forward ultimately to the complete removal of all gaseous wastes from Commission plants and the development of new or adaptation of existing gas-treating facilities for highly efficient operation under conditions singularly peculiar to this new industry.

TECHNIQUES AND TOLERANCE LIMITS

In any consideration of contamination, scientists are accustomed to make use of certain standards or permissible levels. Sanitary engineers and industrial hygienists already need some guides as to relative degrees of radioactive contamination, techniques for their measurements, and safe limits for public safety and health. The radiologist and the health physicist have done much to develop such techniques, standards, and equipment, and deserve much credit for their work along these lines. By means of instruments, such as electroscopes, Geiger counters, and ionization chambers, they evaluate the radioactive energy from nuclear particles, such as alpha and beta particles and gamma radiations. They have made much progress in developing instruments of increasing sensitivity and accuracy. More work along these lines has to be done before the public health profession has the tools it needs to work with. The sanitary engineer, the industrial hygienist, and the so-called health physicist have a lot in common and each has

much to give and receive of his knowledge and experience in the development of this branch of science.

Ultimately, permissible levels for radioactivity, developed and being used currently at plants under the Atomic Energy Commission, will have to be subjected to intensive review by outside experts of wide experience in medical and public health and safety research. They naturally will want all standards recommended to be supported by clinical, epidemiological, and biometric evidence before they are generally accepted. The history of the evolution of other technological standards, which have stood the test of time, forewarns us of this eventuality.

The current values were arrived at largely by mathematical calculations as to equivalent energies involved in different substances and relating these to experience in exposure of human beings and animals to radium. It is pertinent to say that as experience is gained, there is a definite trend in the atomic energy field toward stricter standards. The International Congress of Radiobiology in 1934 had set a limit at 200 milliroentgens (mr) per day, while the American Advisory Committee on X-ray and Radium in 1936 had set the figure as 100 mr per day for X and gamma radiation. Limits currently used stem from a tolerance level for total body exposure of 0.1 roentgen equivalent man (rem) in any 24 hour period. In the case of alpha emitters such as plutonium, the objective in establishing limits is to prevent deposition of a total of more than 1.0 microgram in the body during a person's life.

Morgan gives the permissible limits for 24 hour exposure of employees as established in the Oak Ridge National Laboratory and used by a number of other laboratories as follows:

100 (mr) for X and gamma radiation
100 (mrep) for beta radiation
10 (mrep) for alpha radiation
20 (mrep) for fast neutrons
50 (mrep) for thermal neutrons

Morgan makes the significant point that the factors of safety are low and that we should think of these figures as "maximum allowable" rather than "tolerance" amounts of radiation. In the same paper from which these data are taken he presents extended curves and tables summarizing values for tolerances over one year both in air and water. The values are tentative and much too detailed to be reproduced here in full, but a few figures are listed below as examples:

		One Year Tolerance Concentration			
		In Air		*In Water*	
Element	*Assumed Effective Half-Life*	*microcuries per ml.*	*micrograms per. ml.*	*microcuries per ml.*	*micrograms per. ml.*
RA ^{228} pdts	2 wks.	$2x10^{-10}$	$2x10^{-10}$	..	..
RA ^{226} pdts	10 yrs.	..	..	$4.4x10^{-6}$	$4.4x10^{-6}$
C ^{14} (graphite)	2 mos.	$1.2x10^{-7}$	$2.6x10^{-9}$	..	..
Na ^{24}	14.8 hrs.	$6.3x10^{-7}$	$7.1x10^{-14}$	$4.9x10^{-4}$	$5.5x10^{-11}$
Ca ^{45}	150 days	$2.1x10^{-7}$	$1.3x10^{-11}$	$3.6x10^{-3}$	$2.2x10^{-7}$
S ^{35}	25 days	$3.1x10^{-6}$	$7.3x10^{-11}$	.041	$9.4x10^{-7}$

EXAMPLES OF ATTACK

A great deal of excellent work has been carried out and is in progress or planned for resolving the problem of protecting man and his environment against radioactivity. Of special interest to sanitary engineers are the following:

Meteorology—At the Hanford Works, careful experiments have been carried out to determine the most favorable atmospheric conditions under which to carry out operations. Equipment for similar studies has been installed at the Brookhaven National Laboratory where perhaps the most extensive meteorologi-

cal program of all areas will be carried out. The U. S. Weather Bureau will assist in studies of atmospheric problems at most of the larger areas of operation. The selection of size for reactors and other facilities where radioactive materials are produced, stored, or experimented with, calls for very careful appraisal of meteorological factors, and this is in line with the Commission's policy.

Safety Manual—A manual of *Standard Safety Requirements* has been prepared containing information to be used by plant operators in protecting personnel and by designers in preparing plans for new and for revision of existing plants and facilities. Naturally, it has been subject to considerable revision and change as our experience indicates these needs.

Ground Water Protection—The U. S. Geological Survey is coöperating actively in studies and evaluation of surface and subsurface contamination of water supplies where radioactive and toxic wastes may be discharged into or onto the ground. Such problems are currently being given special consideration at the Hanford Works in Washington, Oak Ridge in Tennessee, and at the Brookhaven National Laboratory on Long Island.

Waste Disposal Research—Contracts have been let with several nationally known chemical engineering and development companies for research to improve chemical processing and recovery of valuable products from stored wastes and for reducing the volume and radioactivity of final plant wastes to the smallest amount practical. Coöperative programs with the Public Health Service and the Tennessee Valley Authority have been developed at Oak Ridge, with the Public Health Service at Los Alamos, and with New York University, for study of the effect of radioactivity on biological processes, especially those common in sewage treatment and stream pollution. Included in one or more of these programs will be studies of the effect of radioactive isotopes on various materials used in plumbing and sewers and related facilities. The cumulative effect of radioactivity on algae and various plankton forms and the effectiveness of standard water purification methods in removing radioactive contamination from water will be studied.

A program for studying the Columbia River in the vicinity of the Hanford Works is being developed with the Public Health Service. The construction of McNary Dam—miles downstream from these works—is expected to have a considerable effect on the biology of the river upstream from the dam, and it is desired to determine the effect of this dam and any relation this may have to operations at the Hanford Works.

USE OF SANITARY ENGINEERS

At most of the larger AEC areas, sanitary engineers are employed to assist in the solution of problems in water supply protection, waste disposal, and general environmental sanitation, including related problems in the villages where workers are housed. The Atomic Energy Commission recognizes the need of complete control over the various environmental factors which concern and affect this new and unique industry. It is most anxious that in its current operations and in the expansion which is sure to come, full advantage be taken of the experience of other new industries in order that their earlier difficulties may be avoided. Many of the areas of vulnerability in the atomic energy field which affect environmental sanitation are those in which the sanitary engineer is especially trained to help. As the industry grows, there will be an increasing need of assistance from sanitary engineers, both at atomic energy plants and in areas surrounding them.

When one considers the potentialities of wartime hazards involved in the field

of atomic energy, whether in production for military purposes or the possibility of enemy action, the importance to the national defense of having a large number of public health workers trained in ways and means of coping with hazards of nuclear fission products is evident to a sharp degree.

CONCLUSION

We should like to reëmphasize that (1) the continued expansion of the nuclear fission industry presents many problems and, therefore, an opportunity and a challenge for the trained sanitary engineer; (2) the Atomic Energy Commission is striving actively for a permanent solution of its waste disposal problem; (3) its objective is that this new industry may expand to meet its potentialities without creating objectionable or hazardous conditions at and in the vicinity of its plants as many new industries have done; (4) public health workers should be trained in fundamentals of nuclear physics so that they may have a better understanding of this new industry and its environmental problems; and (5) the need of training sanitary engineers is especially acute considering their responsibilities in a national defense program.

SELECTED BIBLIOGRAPHY

1. Smyth, H. D. A General Account of the Development of Methods of Using Atomic Energy for Military Purposes Under the Auspices of the United States Government 1940–1945. Supt. of Documents, U. S. Govt. Ptg. Office, Aug., 1945.

2. Morgan, Karl Z. Tolerance Concentrations of Radioactive Substances. *J. Physical & Colloid Chem.*, 51, 4 (July), 1947.

3. Brookhaven National Laboratory, Associated Universities, Inc. *Program Report*, Mar., 1948, Upton, N. Y.

4. Sullivan, William H. Control of Radioactivity Hazards. *Chem. & Engin. News*, American Chemical Society, 25, June 30, 1947, p. 1862.

5. What Every Medical Officer Should Know About the Atomic Bomb. *Bull. U. S. Army M. Dept.* 8, 3 (Mar.), 1948, et seq. (Ten Special Articles)

6. Kelly, R. Emmet. Health Problems Resulting from Newer Technological Developments. *A.J.P.H.* 38, 6:837 (June), 1948

7. Evans, Robley D. *Radioactivity Units and Standards.* Mass. Inst. of Technology. New York: McGraw-Hill.

8. *Glossary of Scientific Terms Relating to Atomic Energy—Report from Senate Report No. 1211*, 79th Congress, 2nd Session.

9. *Fourth Semi-annual Report of the Atomic Energy Commission.* Supt. of Documents. U. S. Gov. Ptg. Office.

Public Health Degrees 1947-1948

The January, 1949, issue of the *American Journal of Public Health* carried the Report on Public Health Degrees and Certificates which has been compiled by the Committee on Professional Education annually for the past 15 years. As in previous years, the report on the academic year 1947–1948 contains valuable information on enrollment, the professional backgrounds of the students, the degrees offered and the degrees granted by the various universities. Because of the special concern which the Engineering Section Project has had in training of engineers and sanitarians, the material this year is more complete than previously with respect to the postgraduate degrees in sanitary and public health engineering; in addition the findings of a special study on undergraduate students and degrees in engineering and sanitation are included. Two summary tables only were published in the January *Journal*. A set of 10 additional detailed tabulations in multilith form are available free on request from the office of the Association.

Housing and Health

Sanitary Aspects of the Dwelling *

M. ALLEN POND, F.A.P.H.A.

Assistant Chief of Engineering Activities, U. S. Public Health Service, Washington, D. C.

DURING the past century "sanitary housing" has been the subject of numerous studies, endless discussion, and some legislation. The political significance of housing has increased with the expansion of public interest in human welfare. After World War I, efforts were made by the National Bureau of Standards and other agencies to influence local governmental units to strengthen building, plumbing, and fire prevention codes. The enactment in 1934 of legislation that established the Federal Housing Administration put the United States Government for the first time squarely in the struggle to improve housing standards and conditions. Three years later the Wagner Act was based on acceptance of the thesis that sanitary housing for all the people is essential to the national welfare, and that continuation of slums is not in the public interest.

Early and recent leaders in the public health movement also have concerned themselves with housing as a factor in community health. Here in Massachusetts a century ago Lemuel Shattuck pleaded for better housing for factory workers.[1] Stephen Smith, 15 years later, presented a strong case against slums and stressed the public health importance of decent housing.[2] In recent years, many of the more thoughtful figures in public health—Winslow, Wolman, Williams, Vaughan, to name a few—have repeatedly emphasized the significance of housing in the community health program.

No purpose would be served here by reviewing what is known about the epidemiological significance of slums and blighted areas. Anderson some years ago pointed out that the standards of housing rest on insecure epidemiological foundations,[3] and others have emphasized this. Nevertheless, whether the exact causal relationship between housing quality and health can be accurately measured, there is ample evidence that good housing is not incompatible with health.

SCOPE OF HOUSING SANITATION

The scope of housing sanitation is broad. Virtually no ordinary problem in environmental sanitation is missing from the realm of the hygiene of housing, and there are problems in housing that are new, if not obscure, in health department practice. To the usual problems may be added those relating to functional design, materials of construction, noise control, illumination, aerobiology, and environmental hazards to mental and emotional health.

Not only is the field broad; it is also complex. It involves legal, economic, and sociological considerations as well as public health. There is a long history of governmental regulation of housing through the use of sanctions to control the structural aspects of new buildings.

* Presented before the Conference of Municipal Public Health Engineers and the Engineering Section of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 9, 1948.

Regulation of occupied multifamily housing has been common for nearly a century. Yet there has been surprisingly little cross-fertilization of the professions and trades concerned with the building, marketing, and control of housing.

Although existing public health activities relate to many of the technical problems in housing, the field itself has been the subject of few specific local health programs. Because housing problems are so complex, it is necessary that there be a frontal attack on them.

Furthermore, it happens that the dwelling is the principal environment of man. Infants average 22–24 hours per day, housewives 20–22, school children 20, and wage earners 15–18 hours daily at home. On the basis of lengths of exposure to hazards that are common to the factory, the classroom, and the dwelling, it is evident that the home is far more significant than either the work place or the school. Gross evidence to support this generalization is to be found in morbidity and mortality data for home accidents, in analyses of the principal causes of industrial absenteeism, and in studies of the spread of epidemic childhood diseases among the younger siblings of school children. We need not and should not wait for more exact data before beginning to act.

STANDARDS

Wide varieties of standards for sanitary housing have been recommended by federal agencies and national associations. In rural and suburban areas especially, Federal Housing Administration standards for dwellings built with guaranteed mortgages have been significant in developing codes of practice where building regulations were formerly either nonexistent or inadequate and poorly enforced. F.H.A. standards deal not only with water supply and sewage disposal but also with heating, fire resistance, structural safety, and minimal room sizes. It is probable that these standards have had greater impact on housing quality the country over than any others.

In the United States the regulation of new housing has traditionally been a function of building officials whose primary concern has been with structural safety, prevention of fire, and protection of life and limb against the hazards of structural collapse or conflagration. In a comparatively narrow sense, building regulations have had sanitary significance in that they contain elemental requirements relating to water supply and sewage disposal, heating, lighting, and ventilation. With rare exceptions, they have been arbitrary, inflexible, and essentially unimaginative, and modern slums have been produced in the face of them.

The control of the quality of occupied housing is usually a responsibility of local health departments. In areas where there are no effective, full-time local health units, there is practically no official action to preserve the quality of good housing, and to improve slum and blighted dwellings. This is understandable. It is not so easy to explain the failure of otherwise effective local health agencies to carry out incisive housing sanitation programs. The leadership of health departments in Memphis, Baltimore, Milwaukee, Los Angeles, St. Louis, and a handful of other communities is noteworthy because it has begun to do something more than investigate housing complaints.

Some of the delay in health department action to improve housing quality may be ascribed to a lack of standards. Health officials have tended to resist activities that are not based on cause and effect relationships. It is obvious from our earlier consideration that such relationships have not been demonstrated in the hygiene of housing, and standards of housing quality have perforce been based on group judgment rather than precise knowledge.

The Committee on the Hygiene of Housing during the past two years has undertaken the preparation of standards for the neighborhood environment, structures and dwelling units, and equipment which is used in the home. Many of the standards recommended by the committee are the product of the considered judgment of its members. The range of training and experience of this group is so wide as to make their group opinions, if not valid, at least cogent.

BASIC DEFICIENCIES

The Committee on the Hygiene of Housing considers that each of the following conditions represents a basic deficiency in the quality of a dwelling:

1. Contaminated water supply
2. Water supply outside unit or structure
3. Toilet shared or outside the structure
4. Bath shared or outside the structure
5. Crowding of more than 1.5 persons per habitable room
6. Crowding of sleeping rooms (persons = 2 x number of sleeping rooms + 2)
7. Less than 40 sq. ft. of sleeping area per person
8. Lack of dual egress
9. Installed heating lacking in three-quarters of rooms
10. Lack of installed electricity
11. Rooms lacking window
12. Serious deterioration

Any dwelling containing 4 or more basic deficiencies is considered to represent an extreme slum.[4]

In surveys recently made in Atlanta, Los Angeles, and Milwaukee, the median numbers of basic deficiencies were found to be 4, 2, and 1, respectively. The high incidence of basic deficiencies in the Atlanta study doubtless stems from the fact that the surveyed area of 2,292 dwelling units represents a known slum. However, there were 4 or more basic deficiencies in 15 per cent of the dwelling units in a representative Los Angeles survey district, and 3 or more basic deficiencies were found in 2,100 of the 9,489 Milwaukee structures appraised.

There are at present no nation-wide data on the incidence of basic deficiencies in either urban or rural housing units. Facts gathered by the Bureau of the Census in its sample survey of April, 1947, however, indicate that there are at least 4.1 million units in need of major repairs (i.e., seriously deteriorated), and 11 million additional units lacking private baths and toilets.[5] Analysis of the available data indicates that there are at least 1.9 million non-farm homes in the United States that have 3 or more basic deficiencies. Nearly 2.5 million dwellings are sheltering more than 1.5 persons per room. Almost one-sixth of all non-farm, non-white units, and 1 in 10 farm houses are thus overcrowded.

Rural housing tends to have the most obvious sanitary defects. In 1940, for instance, there were 3 essentially rural states in each of which more than 100,000 dwellings lacked a source of water supply within 50 ft. of the house, 10 other states each had between 50,000 and 100,000 homes in the same category, and 26 additional states had between 10,000 and 50,000 dwellings with the same deficiency. In North Dakota 29.5 per cent (47,430) of all homes lacked a water supply within 50 ft. of the house. Even urbanized Connecticut had 1,641 such units. Furthermore, sanitary surveys and laboratory sampling programs in several states have shown that more than 75 per cent of existing farm water supplies are unsafe.

In general, more dwellings are provided with sewage disposal facilities than with conveniently accessible water supplies. No state reported more than 100,000 units without toilets or privies, and only North Carolina reported more dwellings lacking sewage disposal facilities than homes without water supplies within 50 ft. The privy building programs that were common between 1934 and 1940 seem to have made an obvious dent housingwise as well as epidemiologically. Unfortunately, surveys sponsored by state health departments since

the end of World War II indicate that more than three-quarters of existing privies are still insanitary.

These specific deficiencies are not limited to rural homes. In the metropolitan areas of New York, Baltimore, Detroit, Chicago, St. Louis, and Los Angeles, the 1940 census revealed 15,709 dwellings lacking water within 50 ft. of the structure. The same communities had 11,795 homes without toilets or privies. In 1945, 12 per cent of all non-farm units in the nation lacked running water. Is this not evidence that there are tangible housing sanitation problems that merit health department action?

THE NEIGHBORHOOD

The dwelling and structure are not the only components of housing that have health significance. Board and Dunsmore have described some of the sanitation problems of urban fringe areas,[6] and the experience of the federal housing agencies demonstrates the health importance of site selection and community planning. Furthermore, the Committee on the Hygiene of Housing has considered the neighborhood as a basic planning unit, and has published standards on the subject.[7]

The significant health principles that should be met in an adequate community environment are:

1. Protection against accident and communicable disease hazards, including provision for maintaining cleanliness
2. Provision of adequate daylight, sunshine, and ventilation with non-polluted air
3. Protection against excessive noise
4. Protection from fatigue and provision of reasonable privacy for the family
5. Provision of opportunities for normal family and community life in esthetically satisfactory surroundings protected against moral hazards

More and more it is recognized that the effect of substandard environment extends beyond direct threats to physiological health, and that it involves also significant detriments to mental and emotional well-being. For the present, at least, measurement of the total health significance of neighborhood deficiencies appears to be impossible. It is to be expected, however, that, like the Mosaic laws, these current beliefs of thoughtful men will some day be validated.

FUTURE PROBLEMS

Events of the past decade have cast a shadow upon the future of urbanization. Great centers of population have become the targets of combatant nations, and civilians in possible future wars will share the horrors which traditionally have been the lot of warriors. A recent release of the National Security Resources Board, in addition to describing some of the factors relating to industrial relocation, contains this statement: "A high concentration of industry or population in a given area constitutes the best target for atomic or other modern weapons."[8]

In planning future communities, and in the redevelopment of existing cities, the dispersal of the populace is likely to be stressed as a security measure. The rate of migration outward from the urban center has been increasing for many years, and there will be no conflict of ideologies in the suburban movement. Serious questions may be raised, however, as to the wisdom of redeveloping urban slum areas and increasing population densities by the construction of vast apartment houses where small tenements stood previously. Psychiatrists and sociologists already have opposed the intensification of urbanization on the hypothesis that man lacks the compressibility of gas and tends to change his mental state at a comparatively low pressure. Defense planners seem to have a more easily recognized reason for curbing population concentrations.

A small committee of the American Institute of Architects is already studying the problems in architecture that

have arisen with the advent of the atomic age. They also are attempting to evaluate present architectural and planning principles as they may be influenced by the possibility of atomic or other unconventional methods of warfare. It is significant that the committee has called upon the Public Health Service for technical assistance in preparing its report.

Although numerous problems in the field of housing have resulted from recent scientific discoveries, many possible advantages may come out of this new knowledge. The harnessing of atomic energy and the development of electronics are likely to produce major changes in dwellings of the future. For example, cheap power and mechanization may alter completely the design of kitchens, and change the lot of the housewife so that she will have more leisure. This, in turn, should result in different functional requirements in the design of the rest of the house. Indeed, standards now recommended may rapidly become outmoded.

We need pedestrian research in the physical aspects of housing. But in the years to come there will be an even greater need for truly imaginative study of man in his social and physical environment. Out of inspired studies may come the keys to a better understanding of the hygiene of housing.

In the meantime it is evident that there exists a wide gap between present knowledge and its application to the job of making dwellings sanitary. The engineer, the epidemiologist, and the health officer, all have the "know-how" now to improve the quality of the existing housing supply, and that which will be built in the near future. The job cannot be done by health departments alone. Rather, there must be coöperative planning and action by local health, building, planning, housing, and fire officials. Part of the framework for this impressive activity will be described by others in this symposium.

REFERENCES

1. Shattuck, Lemuel. *Report of a General Plan for the Promotion of Public and Personal Health in the Commonwealth of Massachusetts.* Boston, 1850.
2. Smith, Stephen. *The City That Was.* New York: F. Allaben, 1911.
3. Anderson, G. W. The Present Epidemiological Basis of Environmental Sanitation. *A.J.P.H.*, 33:113 (Feb.), 1943.
4. *An Appraisal Method for Measuring the Quality of Housing.* Part II. New York: American Public Health Association, 1946. 105 pp.
5. *The Housing Situation: The Factual Background.* Washington: Housing and Home Finance Agency, June, 1948. 35 pp. and tables.
6. Board, L. M., and Dunsmore, H. J. Environmental Health Problems Related to Urban Decentralization. *A.J.P.H.*, 38:986 (July), 1948.
7. *Planning the Neighborhood.* Chicago: Public Administration Service, 1948, 90 pp.
8. *National Security Factors in Industrial Location.* Washington: National Security Resources Board, Sept., 1948, 12 pp.

Diagnosis of Rabies

A one week course in the laboratory diagnosis of rabies, April 25 to 29, is announced by the Communicable Disease Center, U. S. Public Health Service, Atlanta, Ga. The course will be held in Atlanta and is open to all grades of employed laboratory personnel. It will consist, essentially, of practical training in laboratory diagnostic procedures supplemented by lectures and demonstrations. There will be no tuition or laboratory fee. Apply to Ernest S. Tierkel, Asst. Chief, Veterinary Public Health Division.

Housing and Health

Appraisal of Substandard Housing *

EMIL A. TIBONI, M.P.H.

Special Consultant, U. S. Public Health Service; formerly Field Secretary, Committee on the Hygiene of Housing, American Public Health Association, New Haven, Conn.

THERE is a certain restlessness which is immediately apparent on the part of most public health engineers whenever the subject of housing arises. This reaction is usually traceable to three causes: (1) they are acutely aware of the existence of substandard housing in their communities; (2) they are keenly interested in increasing their activities in this field of sanitation; and (3) they do not have a clear idea of where or how to begin.

They recognize the fundamental truth of the statement of Winslow that "We shall make real progress in the elimination of our slums only when the health department has at its disposal a concise and quantitative picture of the actual current status of housing in each possible problem area of the city—such a picture as it now has with respect to the water supplies and dairies and food stores which serve the community." [1]

They are also aware that in many health departments which have made a sincere effort in this field, there exists a tragic monument to a lost cause. It is composed of row after row of cards, each of which bears the record of from one to several sanitary inspections of housing in the city.

It is a tragic monument, not only because of the expense involved in its creation, not only because the man hours which went into it could have been devoted instead to some more productive effort, but because most of the people affected are still living under deplorably unhealthful conditions, and there is no indication that it either has been or will be possible to use these records to do anything significant about the problem.

During the entire history of the public housing program, these records have not been used on any appreciable scale to produce information on local housing conditions.[2] This has been equally true in regard to the more recent urban redevelopment movement.

In a few communities, the health department has conducted systematic enforcement inspections of substandard housing in selected blocks as an adjunct to the community housing program. In these cities, public housing and urban redevelopment are still guided by the very limited information available from such sources as the 1940 Housing Census and the Real Property Surveys.

Even if we assume that the health department in such a program is well acquainted with the particular types of housing deficiencies prevalent in the community in order to have a sound basis for the development of standards and the promulgation of effective legislation—an assumption which is not always warranted—such an approach still suffers severely from lack of orientation to the overall housing conditions and fundamental planning requirements of the city.

---

* Presented before the Conference of Municipal Public Health Engineers and the Engineering Section of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 9, 1948.

That the enforcement of legislation alone cannot effect a basic improvement of housing quality is well demonstrated by the editorial comment of a leading newspaper concerning the result of a long existent and exceptionally well administered systematic enforcement program. Commenting on an article in a national home builders' publication claiming extensive accomplishment for the program, the editorial stated in part "The slum clean-up campaign has brought about the replacement of window panes and plaster in some areas, improved sanitary conditions to some extent and compelled landlords and tenants alike to clear out rat-infested cellars and back yards. But the overcrowded, substandard buildings remain exactly that."

Systematic enforcement of this type can be tremendously useful if it is conducted in areas marked for rehabilitation and spot replanning. That, however, must come after the future use of all possible problem areas has been clearly determined.

In a number of cities, the health department has studied substandard housing on a broad scale before attempting more than emergency corrective action. It has pooled its resources and its problems with other city agencies including the planning, housing, and redevelopment agencies, as well as the enforcement agencies such as the building and fire departments.

In one small city, a study of *all* the suspected problem areas was conducted in a few months under the sponsorship of over 35 official and nonofficial agencies. In approximately a dozen other cities, permanent programs under the combined sponsorship of several departments have been in progress for periods ranging from a few weeks to several years. The results in five of these cities are described in a recent issue of *The American City* magazine.[3]

The key to these coöperative programs has been a method of evaluation which produces information on many aspects of housing in a single appraisal rather than considering sanitary, structural, sociological, or other defects separately and alone. This method, the A.P.H.A. housing appraisal method,[4] can produce a body of accurate objective information which is understandable and useful to all local agencies concerned with housing improvements. It can facilitate the formation of official policy by providing the facts needed to classify a city into four groups of areas:

1. Areas in which the dwellings and their environment meet an accepted local minimum standard of quality
2. Areas with moderately advanced blight but in which the dwellings and environment can be restored to an acceptable minimum standard by the enforcement of suitable legislation
3. Areas in which the dwellings are so poor that it would not be feasible to restore them to an acceptable minimum standard, thus making it advisable that they be demolished or converted to other suitable uses
4. Areas in which the environment is so poor that they should be cleared of housing and replanned for other uses regardless of the existing quality of dwellings

The replanning necessary for the improvement of certain areas will also require facts concerning the basic social and economic composition of the population. Much of this information too can be obtained from the descriptive data recorded concerning the dwellings and the occupants.

Where then does a community begin to establish studies of this type? Experience in such cities as Los Angeles, St. Louis, Philadelphia, Brookline, Mass., and Battle Creek, Mich., indicates that the primary requirement is the establishment of a coöperative working arrangement among the interested agencies. As the result of this coöperation, the man power or cash required for the appraisal of areas of mutual interest is brought well within the means of each of the participating agencies.

With the establishment of programs

of systematic appraisal, many health departments have chosen to reduce the inspection of housing complaints to cases which may present serious hazards to health. They are instead assigning the nuisance complaint inspectors as a share of their contribution to the interagency appraisal program. Some building and fire departments are following a similar procedure. Despite great differences in the background of personnel contributed by the various agencies, workers produce virtually uniform results because of the objectivity of the appraisal procedures.

The results of these coöperative programs have been gratifying. Uses of data have ranged from the preparation of housing legislation and its enforcement through to the guidance of policy and the provision of working data for planning, rehousing, and urban redevelopment. In Los Angeles and St. Louis, the data have served to reveal significant local deficiencies which have been used as guides in preparing and securing the passage of new housing ordinances. In Battle Creek, the data are pointing the way toward the very first steps to be taken in a community which has not previously had a housing program of any type.

The use of the data for planning low-rent housing projects, the selection of tenants, and the systematic rehabilitation or condemnation of the vacated dwellings has been practised in many cities and has been particularly successful in Los Angeles. In all of the larger cities, an outstanding use of the data has been in the selection of areas and the preparation of plans for large-scale redevelopment. The appraisal in Philadelphia, which has been conducted primarily for this purpose, has covered areas totalling approximately 2,500 blocks and 125,000 dwelling units.

Training in the A.P.H.A. appraisal method, until recently available only on a consulting basis from the Committee on the Hygiene of Housing, can now be obtained without charge through the U. S. Public Health Service at the Training Division of the Communicable Disease Center in Atlanta. Information concerning this training may be found in the 1949 catalog of the Communicable Disease Center [5] which is available on request. The Public Health Service is also available for field service to agencies interested in establishing housing sanitation programs.

If we are to rid our communities of substandard housing, we must recognize that they are dynamic living organisms and treat them accordingly. We cannot much longer risk the searching experimental approach of the anatomist to the laboratory specimen. We must instead substitute the controlled approach of the surgeon, in order to be certain that we will remove all the decayed areas without at the same time destroying what is still useful. By intelligent planning and the selective enforcement of appropriate legislation, the factors causing decay can be controlled and much moderately substandard housing can be rehabilitated. By demolishing only the exact housing which cannot be salvaged, and enforcing the rehabilitation of that which can be saved, we may be able to reduce the job of eliminating our slums to practicable economic limits. In such a coöperative program, the health department has a vital part.

REFERENCES

1. Winslow, C.-E. A. *An Appraisal Method for Measuring the Quality of Housing*, Part I, Foreword. Committee on the Hygiene of Housing. New York: American Public Health Association, 1945. 71 pp.

2. Pond, M. Allen. Need for Systematic Evaluation of Substandard Housing, *A.J.P.H.* 37:967 (Aug.), 1947.

3. Tiboni, E. A., et al. Systematic Inspection of Substandard Housing. *The American City*. LXIII:5 (May), 1948.

4. *An Appraisal Method for Measuring the Quality of Housing*, Part I. Committee on the Hygiene of Housing. New York: American Public Health Association, 1945, 71 pp.

5. *Bulletin of Field Training Programs*. Federal Security Agency, Public Health Service, Communicable Disease Center. Atlanta, Ga., 1949.

Housing and Health

The Provision of Good Housing *

CATHERINE BAUER

Department of Regional Planning, Harvard University, Cambridge, Mass.

THE sequence of talks at this session is a recapitulation of the ever widening field of concern in the evolution of the housing movement. The great "sanitary awakening" of the mid-19th century, which brought water and sewerage systems, was followed by increasing awareness of substandard qualities in dwelling structures per se, hence a wave of restrictive measures. Then came the positive effort to produce decent new dwellings to rehouse low-income families and provide an adequate supply of homes, which broadened in turn to the current emphasis on overall neighborhood and community planning.

It would be interesting to look at this history purely from the viewpoint of the health sciences, for it parallels and expresses the progress of scientific principles and purposes very neatly. Sanitary measures were undertaken to curb the fearful epidemics of filth-bred disease. Then gradually it became clear that not only the absence of dirt but the presence of sun, air, and adequate space are essential to the prevention of disease. And finally the whole emphasis changed from a remedial approach to more positive and constructive goals.

Dr. Winslow has probably done more than any other single individual to bring about this shift in emphasis, so I quote from him. In setting modern housing standards, he says, health "must be interpreted in the broadest sense, to include not only the avoidance of disease but also the positive attainment of mental and emotional well-being." And again, "Health means more than just staying alive. Health means vigor and efficiency and satisfaction in living." We are therefore concerned today not only with restrictive housing standards and the elimination of slums, but also with the provision of homes and neighborhoods that are *positively* good—a residential environment that promotes mental and social well-being as well as physical health per se.

Now if it could just be assumed that these evolving principles would gradually be put into practice—simply by the rational and more or less automatic application of the latest knowledge to concrete human problems under the benign rays of that old *deus ex machina*, "Progress"—the history of the housing movement would hardly be worth mentioning in a meeting like this one. Under such circumstances, if you scheduled a session on housing at all, it would be solely to hear about recent scientific developments likely to affect your own future work. And you would certainly not invite someone like me, with no status whatever as a scientist (hardly even as a lowly "social scientist"), to talk to you. Indeed, such people—I supposed we might best be classified as "agitators" in the housing and planning fields—would have to seek other employment entirely.

But here I am. It is all too obvious that the wheels of progress in housing matters have not been moving as

* Presented before the Conference of Municipal Public Health Engineers and the Engineering Section of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 9, 1948.

smoothly or as rationally as they should have.

So perhaps it may be worth while to remind ourselves that the chronology of the housing movement can be viewed not only as a significant chapter in scientific history, but also as a very lively and important chapter in *political* history.

For every major step in housing progress in the past century has involved some public action, from the early English sanitary measures through the tortuous history of building codes to the U. S. Housing Act of 1937 and the successive proposals to deal with the current shortage. And public action in a democracy usually means political controversy, as was well evidenced by the wild and abortive career of the Taft-Ellender-Wagner Bill in the last session of Congress. Indeed, almost all discussion of the "housing problem" and its solution is now crystallized in political terms — even including the question of technological progress.

It might be claimed, however, that the political aspects of housing, no matter how noisy, are purely secondary and incidental. In an "advanced" country it might be held that, once science has demonstrated the need and the means, political action will be taken sooner or later to whatever extent is necessary to achieve the predetermined ends.

But such a theory gives cold comfort to homeless veterans or harassed local officials in the immediate housing crisis. I propose therefore to explore quite a different hypothesis, which may prove more illuminating as to the nature of our current difficulty. I suggest that political philosophy — the motivating forces behind public action and the application of scientific knowledge—is not secondary or incidental, but *paramount*.

Let us look back very briefly to an earlier illustration. Housing first became a lively political issue in England just about a hundred years ago, when the Earl of Shaftesbury put through the first piece of national housing legislation in 1851. Of course it was essentially an offshoot of the public health movement, whose first great triumph was the English Public Health Act of 1848.

What brought about these measures? Superficially the answer is simple: terrible epidemics on the one hand, and on the other a new faith in the remedial powers of science. But there is a curious time-sequence here which is worth remarking. For the sanitation movement was well under way *before* the need for it was scientifically proved through the development of bacteriology. Here I must turn once more to that indefatigable interpreter of medical history, Dr. Winslow, who wrote that "the scientific basis for the great sanitary awakening was merely a vague consciousness of a relation between filth and disease, colored by traditional Hippocratic doctrine of miasms." Pasteur made his great discoveries in the 1870's, but Chadwick published his classic survey of *The Sanitary Condition of the Labouring Population of Great Britain* a generation earlier, in 1842. And, equally significant, it sold 10,000 copies and started a wave of legislation all over the civilized world.

Clearly, refined scientific proof lagged behind both social conviction and political action. And, even more curiously, the political action was taken at the very zenith (and in the very stronghold) of the doctrine of *laissez-faire*, of every man for himself, and at a time when even the most horrendous results of untrammeled individualism were still excusable on the grim Malthusian argument that without misery there would shortly be overpopulation and general ruin . . . and also, it might be added, long before there was anything approximating universal suffrage to implement the demands of the underprivileged.

But there were other political forces just beginning to take shape; that mixed array of social motives and ideals

which went into what is usually called the "humanitarian" movement. The early health and housing measures were among the first important political expressions of this movement, but its springs go back, undoubtedly, to the 18th century concern for the rights of the individual and the whole hopeful concept of the responsible, perfectible human being which stimulated the rise of democracy.

This was the broad sweep. But the public concern for physical welfare, as distinguished from civil liberties, suffrage, and popular education, can probably be more directly traced to the movement that gradually reformed the English Poor Laws beginning in the early 19th century. These reforms were slow and feeble, but they nevertheless established a world-shaking principle. Henceforth modern society could not just let people die, whether from starvation or sickness, no matter what the dismal science preached. Some minimum care and subsistence had to be provided.

The moment this principle was accepted, the health and housing movements were inevitable, not only on idealistic grounds (or because epidemics spread from slums to other areas), but for economic reasons as well. The taxpayers had an interest, whether recognized or not, in keeping people healthy, just as they had an interest, however disregarded until much later, in keeping people employed at a decent wage. James Tobey, another eminent historian of the health movement, put it baldly: "The first public health reform in England can be said to be really the direct consequence of the Poor Laws, for it was the desire to reduce the enormous expense of caring for sickness which led to this public health act."

Thus was born—out of democratic ideals, fear, and prudence—the principle of "minimum standards," available to all and implemented by public action where necessary, a principle which of course fathered the whole social security movement as well as health and housing measures.

Perhaps this partial economic interpretation sounds cynical? But the intellectual climate of the Victorian era was not one of extravagant idealism, and all reform was likely to be frankly tempered by more practical considerations one way or the other, to put it mildly. Sir Edwin Chadwick, the selfless agitator who had initiated the entire health movement almost singlehanded, was using the language of the times when he devoted a lengthy address to hard-boiled pounds-and-pence arguments for social reform:

"I venture to invite your consideration of men as an investment in capital," he said to the National Association for the Promotion of Social Science in 1869, "as a pecuniary, 'a transaction,' in relation to which we have to consider the means of rearing him with the view to the return of the highest percentage of profit over and above the cost of his nurture . . . upon that investment." When he turns his attention to Glasgow and Manchester, where half the babies then died before their fifth year and the rest were early debilitated, he argues that "this waste of national stock is as it would be with the farmer, if he had to rear two colts to obtain one working horse, and as if the horse when reared did not last in working or productive condition, much of half its natural time."

It was not until the 1930's that we in America began to get a flood of earnest local studies demonstrating that "Slums Cost Money," but the argument had a venerable tradition behind it. Edith Elmer Wood was appealing to the spirit of "enlightened self-interest" in housing matters when she lifted quotes from *U.S.D.A. Farmers' Bulletins* with such effective irony. Some of you doubtless remember them. One was: "Proper housing is an important factor in the successful raising of hogs. If

little pigs are to get the right start in life, they must have plenty of sunshine." And another: "Growing chicks and laying hens need comfortable houses that are dry and roomy, with plenty of fresh air and sunlight. It never pays to overcrowd them."

It seems clear that one of the historic mainsprings of housing reform is the political principle that maintenance of certain essential minimum standards is in the *public interest*.

This principle is, as a matter of fact, quite generally accepted in the United States today, even with respect to housing. Such an eminent conservative as Senator Robert Taft made no headlines when he said in a Congressional hearing, "The Federal Government is committed to a policy of housing . . . on a social welfare ground. We are interested in providing a floor under essential services so we can eliminate, as far as possible, extreme poverty and hardships from the United States . . . Housing is one of those things."

Why, then, are we not farther along toward a solution of the housing problem? Why, when it is so clear that ordinary private enterprise cannot possibly solve the shortage or get rid of the slums by itself, has it been so difficult to revive even a token program of federal aid for low rent public housing? Why is the housing situation in 1948 in the richest country in the world worse than it is in the Scandinavian countries, worse even in some respects than in England, despite all their wartime destruction and post-war economic crises?

Certainly there is no lack of proof that bad housing conditions are socially harmful, no lack of knowledge as to what an acceptable "minimum standard" in housing should include.

Perhaps the principle of "minimum standards" is not enough to galvanize us into positive action, after all. The fact is that the progressive European democracies have within the past generation accepted an additional and much more dynamic political principle with respect to housing. With the rise of social democratic parties and labor and coöperative organizations, the *direct* interest of ordinary consumers and wage earners (as distinct from the "enlightened self-interest" of the early humanitarians) began to make itself felt in housing matters. And with it came a new political concept: *the right to a decent home*. Henceforth it was not just a question of "minimum standards" to allay disease or prevent divorce or save the taxpayers money (or of sporadic housing programs tied to one emergency kite or another, to provide employment or increase the birth rate or improve the physical qualities of soldiers or lessen the danger of revolution), but good housing for all, to be provided by public action where private enterprise could not do the job, on the fundamental democratic principle of *equal opportunity*. It was on this basis that the remarkable inter-war housing achievement in several European countries was brought about.

Nor is this principle unrecognized in America. Indeed, it has never been better stated anywhere than by the Committee on the Hygiene of Housing of the American Public Health Association, whom I am happy to quote in such appropriate surroundings: "The case for proper housing for our people does not depend upon . . . evidence that the provision of good homes in good neighborhoods lowers death rates or reduces sickness. It has ample justification in the democratic principle that people are entitled to an opportunity for good homes just as they are entitled to an opportunity for education."

But we have not yet accepted this principle in America in any effective political sense. We have had a series of emergencies; in fact there has been one kind of housing crisis or another almost continuously ever since 1917, and the

present shortage has been developing ever since 1930. We have also had a hectic succession of emergency measures, some sound though limited, some partly or wholly opportunist. But we have nothing remotely resembling a broad, well considered long-term national housing policy. And most of our failure and confusion to date are due, I think, to the simple fact that we have not yet accepted the principle that American families are *entitled* to decent homes.

Syrup of Urethane and Lithium Salt Substitutes Embargoed

The Food and Drug Administration, Federal Security Agency, Washington, D. C., has recently had occasion to issue several warnings dealing with drugs which are of considerable public health interest.

The Administration has directed seizures of Syrup of Urethane, a cough syrup manufactured by Marvin R. Thompson, Inc., Stamford, Conn. Physicians, pharmacists and consumers are warned that the administration of urethane in the quantity recommended on the label may cause a dangerous lowering of the white blood cell count. More than 2,300 gallons of the syrup have been distributed in about 3,400 packages throughout the country. The coöperation of public health workers in locating and embargoing this product is requested in view of the obvious difficulty in locating all samples promptly.

According to the Administration, the drug urethane has been used as a sedative for about 100 years, but recent medical studies indicate its potential danger when used as directed in the labeling of this syrup. Most cases, however, discontinuing the use of urethane, result in the return of the white blood cell count to normal in a short time.

The Food and Drug Administration has also declared that there is considerable doubt as to the safety of unrestricted use of any salt substitute in the presence of cardiovascular-renal disease and a low sodium diet. The Administration has declared that each salt substitute is a new drug within the meaning of the Federal Food, Drug, and Cosmetic Act, and that interstate distribution of each salt substitute should be discontinued until a new drug application has been filed and has become effective with respect to the substitute.

Recent experiments on lithium chloride made by the Administration show that it is toxic to animals, and untoward reactions in man appear to have resulted from the consumption of lithium chloride.

On February 18 the Administration learned of deaths attributed to lithium chloride and through public announcements of the dangers it has advised that the use of this drug be discontinued. The symptoms of lithium chloride poisoning are drowsiness, weakness, loss of appetite, nausea, tremors of the extremities, blurring of the vision, and coma.

Housing and Health

The Planned Community *

FREDERICK J. ADAMS

Head, Department of City and Regional Planning Massachusetts Institute of Technology, Cambridge, Mass.

IF there is one point on which planning and housing experts have reached agreement it is that the home is more than a dwelling unit, or even more than a collection of dwelling units. All members of the family today spend a considerable portion of the daylight and evening hours outside the house, and housing environment has come to be recognized as equal in importance to the dwelling unit itself. In planning our communities and our large-scale housing developments, therefore, we must consider the relationship of the dwelling not only to the private space which surrounds it but also to the public facilities for recreation, education and culture, and to neighborhood shopping and transportation centers.

Clarence Perry has defined housing environment as comprising "that area which embraces all the public facilities and conditions required by the average family for its comfort and proper development within the vicinity of the dwelling."[1] Whether or not we agree that the word "neighborhood" accurately describes such an area in its physical concept, it is generally agreed that it represents the minimum area for the purposes of comprehensive planning.

The A.P.H.A. Committee on the Hygiene of Housing, on which I have had the pleasure of serving during the past 10 years, has adopted Perry's concept of the neighborhood and in its recently published report entitled, *Planning the Neighborhood*, states that:

> Acceptance of the neighborhood concept implies that adequate housing consists not merely of the individual homes, no matter how well planned or how well located; but that all residential and community facilities and services required for the shelter, health and convenience of the residents of a neighborhood must be included in a neighborhood—or must be made available to its residents.[2]

The committee further states that,

> Standards for housing environment must deal at least with the smallest geographic unit which includes those basic facilities and conditions; a unit which will permit organization of physical surroundings to eliminate inconveniences and hazards; and which will provide a physical form suitable for the full development of community life.[3]

In addition to community facilities for education, recreation, shopping, and transportation, provision must also be made for water supply, light and fuel supply, telephone, storm water and sewage disposal, other waste disposal, fire protection, and police service.

If we recognize the importance of the housing environment to the health, safety, and general welfare of our urban and rural population, it is essential that we come to some agreement on the ways and means of attaining our objectives. I do not have time, within the limits of this short paper, to describe and justify the standards of neighborhood or community design which must be adopted if we are to raise the quality of family living in our residential areas. In any case, a full description will be found in the report of the Committee

* Presented before the Conference of Municipal Public Health Engineers and the Engineering Section of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 9, 1948.

on the Hygiene of Housing to which I have already referred.

As practitioners in the field of public health, I believe you would be particularly interested in the administrative and legal means that are available to, or desirable for, the average American community in the proper development of its residential areas. You come in direct contact with many of these in your everyday work and in the case of some, such as housing and sanitary codes and building regulations, you have had a considerable influence on their adoption and enforcement.

The chief legal means for the proper control and guidance of land development in this country are Master Plans and Official Maps; Zoning Ordinances; and Subdivision Regulations. These are closely related controls, but I will discuss them in turn.

The concept of the Master or Comprehensive Plan, as it has developed in the United States, is not a single map but a program. It is comprehensive in scope, and involves all matters affecting the development and redevelopment of a city or region. It represents the best thinking of the planning agency, aided by all other departments of the government that are affected. The Master Plan deals with such problems as land utilization, highways and transportation, schools and recreation, water supply and sewage disposal, and housing. Such a plan should be considered as a guide to future development rather than as a blueprint for a specific construction program, for which reason the proper timing of projects should be given as much consideration as their location or design.

The methods by which the Master Plan is used to control future development vary in different parts of the United States, depending on state enabling legislation and local ordinances. However, the usual procedure is to require that no physical improvements in a municipality may be carried out by an operating department unless they conform to the Master Plan. A less stringent control occurs where only a report from the planning agency is required before action can be taken by an operating department. In recent legislation in the United States providing for the redevelopment of blighted areas in cities, it is required that plans for redevelopment be in accordance with the Master Plan for the whole city, and that the planning agency designate the general type of development appropriate to each area.

In the legislative aspects of planning, much progress which has been made in recent years is in the field of Zoning. In the United States, the legal basis for this phase of planning activity is the police power. This means that each ordinance must be confined to dealing with problems relating to the "health, safety, morals, convenience, and general welfare" of the community. For this reason, zoning regulations in different parts of the country are quite similar, although some states go further than others in the delegation of powers to local authorities. The development of zoning came about primarily because of the need for improved conditions of light and air in and around buildings. It also stemmed from a desire to preserve the character of established residential districts by protecting them from an intermixture of commercial and industrial uses. More recently, restrictions on population density have been incorporated in many zoning ordinances, usually by specifying the minimum size of lot upon which a dwelling may be built. In the case of multi-family districts, the minimum area of lot per family is specified. Some residential districts in outlying suburban communities have enacted ordinances containing minimum lot sizes of from one to five acres.

Zoning also provides an effective means of preventing the development of land unsuitable for any intensive pur-

pose. What is commonly known as "Rural Zoning" has as its object the restricting of large undeveloped areas to forestry or recreational uses. In a number of states, rural zoning has been successfully used to prevent the construction of residential or commercial buildings on sub-marginal land or within the boundaries of flood plains.

Next in importance to zoning, in the procedures which make possible the better planning of urban and rural areas, is the use of regulations dealing with Subdivision Control. In the past these have generally been confined to restrictions governing the location, width and grading of streets, in order to insure that future connections can be made with water and sewer mains and that streets can be properly drained of surface water. Such regulations are usually administered by the engineering or public works department of the community, or in some cases by a separate agency such as the Board of Survey in Massachusetts. There is a strong tendency toward placing this power in the hands of the local planning commission, which in the past has acted in an advisory capacity only. This has made possible a much closer relationship between control over the private subdivision of land and the planning of public streets, buildings, and open spaces.

We are inclined to minimize the efforts of those architects and engineers of the 19th century who worked for the enactment of adequate planning legislation. In a study I made 12 years ago for the Massachusetts State Planning Board on the history of community planning in Massachusetts, I came across the following quotation from a report prepared by N. Henry Crafts, a Boston consulting engineer, who was engaged to prepare a plan for the future extension of the sewer system of the City of Haverhill. In connection with this plan Mr. Crafts found it necessary to lay out a number of new streets, and his report to the city includes the following proposal:

> I would make it unlawful for the owner of any undeveloped lands within the limits of such towns or cities as may accept the proposed legislation, to lay out any proposed streets, ways, or courts, or to proceed to build the same, or to sell land bordering upon such prospective streets, ways, or courts without first giving notice to the proper authorities, filing a plan showing the proposed location and grades of the street and receiving a permit. In this way, the whole matter of the location of streets on undeveloped lands may be controlled and directed in such a manner as to obviate the extravagant outlays which almost every town or city of my acquaintance has had to incur in street widenings, extensions, and changes of grade.[4]

This report was published in 1877—just 71 years ago—but it was 30 years later before the Board of Survey Act was passed by the General Court in Massachusetts and nearly 60 years went by before planning boards were granted general powers of control over subdivision design.

It is unfortunate that the aspects of zoning and subdivision control in the United States have been separated from planning to a greater extent than is the case in other countries. One of the results of this has been the enactment of zoning regulations in communities which have prepared no plans for future physical development. Zoning then becomes an instrument for maintaining the status quo. At best it results in the protection of existing developed areas from invasion by uncongenial uses of buildings or land. However, the tendency on the part of most planning agencies is definitely in the direction of a closer coordination of planning and zoning. In the preparation of new zoning ordinances and the revision of existing ones, more effort is being made to relate areas set aside for different uses to the probabilities of development. This attitude has been stimulated by the fact that the rates of growth for both population

and land values in the central areas of many large cities are downward. For the same reason, zoning regulations are tending to become more restrictive, particularly as they affect building height and coverage and population density.

One example might be mentioned to indicate how planning is becoming recognized as an essential factor in the improvement of community values. The broad powers granted to the City Planning Commission under the charter adopted by New York City in 1938 may be considered a case in point. Here a department of government, which formerly had been acting only in an advisory capacity, was vested with the responsibility for regulating and coördinating all elements in the physical development of the community. It is worth noting that the City Planning Commission of New York is responsible not only for the preparation of a Master Plan dealing with future developments such as streets, parks, buildings, utilities, and other services. It is also responsible for the preparation of the capital outlay budget, a long-term financial program based on individual requests for appropriations submitted to the Commission by the heads of city departments. During the past 10 years, this procedure has been officially adopted by a number of other cities and towns.

I think I have said enough to indicate that most of our communities have sufficient power to carry on an effective planning program if they choose to do so. Why is it, then, that so much of our residential and commercial development is continuing to follow patterns which are socially and economically undesirable? Some of the responsibility can doubtless be placed on professional planners and on members of planning commissions. Many of the latter are not fully alive to the opportunities for sound community planning that are available to them under existing legislation. They suffer from inadequate budgets, disagreement as to social objectives, and a certain amount of interdepartmental jealousy. There is an insufficient supply of qualified planning technicians and consultants, and to some of these expediency is a more controlling factor than imagination.

However, I do not believe it is on the shoulders of our planning commissions or of our professional planners that we can place the major responsibility for our failure to achieve the goal of the Planned Community. If the majority of our citizens were convinced of the desirability of exercising foresight in the future development of our cities and towns, no city council or board of selectmen could be elected which ignored the principles of sound planning.

Planning is just as much a political and administrative function as a technical one. Until long-range planning and pragramming is recognized as an integral part of government in a democratic society, at the policy making as well as the departmental level, it is idle for us to draw up beautiful master plans and elaborate reports showing the way in which we would like to see community development take place. The day of the Planned Community will come only when foresight and teamwork is recognized as the joint responsibility of architects, engineers, planners, municipal officials, and the great body of the public for whom the plans are being made.

The public is quick to recognize that on it falls the cost of planning and development. Perhaps when it is equally well understood that it is the public which must pay the price for *not* planning, we will be well on the road to the Planned Community.

REFERENCES

1. Perry, Clarence. *Housing for the Machine Age*, 1939, p. 50.
2. Committee on the Hygiene of Housing. *Planning the Neighborhood*, 1948, p. 2.
3. *Ibid*, p. 1.
4. Crafts, N. Henry. *Report of Special Committee on Plan for Sewerage System for the City of Haverhill, Mass., 1877.*

Q Fever

History and Present Status *

R. E. DYER, M.D., F.A.P.H.A.

National Institutes of Health, U. S. Public Health Service, Bethesda, Md.

MUCH progress has been made in our knowledge of Q fever since it was first described in 1937. The story had two beginnings at about the same time curiously enough; one in Australia, the other in the United States. In each instance an infectious agent was isolated and classified as a rickettsia. These infectious agents, isolated on opposite sides of the globe, were soon shown to be identical.

In 1940 this disease, scarcely considered as of more than minor importance up to that time, suddenly assumed greater stature when, through the study of a laboratory outbreak, it was found to produce a pneumonitis and clinically in many instances to resemble the atypical pneumonias. At the present time the known endemic areas, spotted with epidemics, are widely scattered over the globe—Australia, the United States, various countries of the Mediterranean area, Panama, and Switzerland. Finally, Q fever has added one more to the ever increasing list of animal diseases transmissible to man.

In 1937 Derrick [1] published a report on cases of a hitherto unrecognized disease entity which had been occurring in a large abattoir in Brisbane, Australia, since 1933. To this disease he gave the name Q fever. In his original report he described nine cases in detail while brief notes on additional cases resulting from laboratory infections were made by Burnet and Freeman,[2] and by Smith, Brown, and Derrick.[3]

It has been stated in the literature that the name Q fever was given the disease because it was first described in the state of Queensland, Australia. This apparently is in error. Derrick and Burnet [4] give interesting accounts of the choice of the name.

In the early investigations the disease was known as abattoir fever. This seemed undesirable on account of implications of possible danger to meat supplies, and also on account of probable objections on the part of the industry. It soon became clear to the Australian investigators that the disease was also present on farms. Derrick tried to find a suitable name of Latin or Greek derivation without success and finally chose "Q" fever, the "Q" standing for "Query." The name, "Queensland Rickettsiosis" was discussed, but rejected, as it was thought cases might be found outside of Queensland. It is evident from the foregoing that the use of the name Queensland fever is historically incorrect.

Although many additional cases have been reported by Australian investigators, no very definite epidemiological deductions have been drawn. As has been noted, the cases first reported by them occurred among workers in an abattoir. The individuals affected were not engaged in the same activities in their daily work, nor did they work in any particular section of the abattoir, and there was no evidence which would suggest person-to-person transmission.

* Presented before the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 12, 1948.

Using serologic methods, cases have been identified in Australia outside the original Australian focus. These cases have been among foresters and dairy workers.

In the abattoir we at once think of the possibility of acquiring infection through actual contact with the animals in process of slaughtering and preparation of animal products, or by infected air-borne particles containing matter from animal sources. In cases among farmers that source of infection is probably present, as it may be among foresters, but the rural group also suggests contact with infected arthropods.

Derrick [5] succeeded in transferring the infectious agent of Q fever from some of his cases to guinea pigs by blood inoculation, and later he and his colleagues found other common laboratory animals and several species of native rodents and three native marsupials to be susceptible. Burnet [6] found that the etiological agent passed through bacterial filters and discovered rickettsia-like bodies in the spleens of infected mice. He was able to grow these organisms on the chorio-allantoic membrane of the developing chick embryo. Derrick [7] subsequently suggested the name, *Rickettsia burneti*, for the organism observed by Burnet.

Probably influenced by the fact that the etiologic agent appeared to be rickettsial in nature rather than by any definite epidemiological evidence, Derrick and Smith [8, 9] made search for infected animals and infected arthropods in nature and succeeded in isolating three strains of *R. burneti* from bandicoots and six strains of the organism from ticks (*H. humerosa*). Smith [10] was able to show transmission of the infection to guinea pigs by infected ticks of the same species during the process of feeding.

In 1938, Davis and Cox,[11] and Parker and Davis [12] at the Rocky Mountain Laboratory at Hamilton, Mont., reported the isolation of a filter-passing agent, infectious for laboratory animals, from the tick *Dermacentor andersoni*. The ticks from which this infectious agent were recovered had been collected in the spring of 1935 near Missoula, Mont., at a place called Nine Mile Creek, and the disease produced in animals was called "Nine Mile Fever." This name was used in one of the early publications. The authors noted in their first publication that this was probably the same infectious agent encountered by Noguchi in 1926 under similar circumstances.

The Montana workers described a rickettsia-like organism which was associated with the new infection and named it *Rickettsia diaporica* on account of its ability to pass through ordinary bacterial filters, differing, in this characteristic, from other recognized rickettsiae. In the laboratory it was noted that this rickettsia was transmitted to susceptible animals by *D. andersoni* in the process of feeding, and that it survived in ticks through successive moults and through the egg stage.

Cox [13–15] failed in attempts to cultivate this organism on a wide variety of media, including all those found suitable for the growth of such organisms as tularense, leptospira, and bartonella, but found that it grew readily in living tissue cultures.

Since the early work in Australia and Montana, several species of ticks have been found infected in nature or have been shown to be able to transmit the infection experimentally, but aside from occasional incident, it does not seem that ticks play an important part in the transmission of the disease to man, although they may be important factors in maintaining the disease in nature. The ticks so far incriminated are *Dermacentor andersoni*,[11] *Dermacentor occidentalis*,[16] *Rhipicephalus sanguineus*,[17] *Ixodes holocyclus*,[18] *Haemaphy-*

salis bispinosa,[19] *Ornithodoros moubata*, *Ornithodoros hermsi*,[20] *Amblyomma americanum*,[21] *Hyalomma savignyi*,[22] and the spinous ear tick, *Otobius megnini*.[23]

In 1938 one of the workers[24] of the staff of the National Institute of Health, Washington, D. C., spent 4 days in the laboratory in Montana where the infectious agent isolated by Davis and Cox from Montana ticks was being carried in laboratory animals. This worker returned to Washington and there developed an illness of about 10 days' duration; the incubation period was from 11 to 15 days. From his blood an infectious agent was isolated in guinea pigs and identified as the same infectious agent as was under study in Montana, (*R. diaporica*). How the disease was contracted in the Montana laboratory was never determined. This strain, called the X or Dyer strain, was studied in animals and found to produce no immunity against strains of Rocky Mountain spotted fever and typhus. As it happened, the individual who had contracted the Montana infection, had been working in the laboratory in Washington with the Australian Q strain which had been sent to him by Burnet. This strain had been lost several weeks before the time of his illness, but five recovered guinea pigs remained on hand. These animals were found to be immune to the Montana strain. A second strain of the Q fever organism was secured from the Australian workers and serological and immunological comparison with the Dyer strain showed that these strains were at least closely related, if not identical.[25, 26] Subsequently, work by Burnet and Freeman[27] in Australia confirmed these findings.

The knowledge of this disease and of the causative agent up to the spring of 1940 may be summarized as follows:

An infectious agent had been isolated from human cases of illness, and from naturally infected bandicoots and ticks in Australia, and identified as a rickettsia. A rickettsia had been isolated from ticks in Montana and, by accidental laboratory infection, had been found to be infectious for human beings. These two rickettsiae had been shown to have at least a very close relationship, being serologically and immunologically identical. These rickettsiae, or this rickettsia, had been shown to be present in arthropods in nature, and naturally infected animals had been found in Australia, and the conclusion seemed warranted that this disease was arthropod-borne in nature.

Although the etiologic agent of Q fever was classified as a rickettsia, it was recognized early that certain differences exist between it and all the other rickettsiae. Morphologically and in its tinctorial and cultural characteristics it belongs with the other rickettsiae. On the other hand, it does not develop agglutinins for any known strain of Proteus, and it readily passes bacterial filters. These variations, coupled with the fact that the organism shows greater resistance to physical and chemical agents than other rickettsiae,[33] justify the setting up of the Q fever organism as the type organism of a new genus, Coxiella (Philip 1943), hence, *Coxiella burnetii* supersedes *R. burneti* and *R. diaporica*.[28]

A few cases, apparently contracted in nature, have been reported in this country,[29, 30] but convincing epidemiological evidence incriminating arthropods as transmitters to human beings is lacking. Until the spring of 1940 we had the picture of a rickettsial disease fairly widespread and probably arthropod-transmitted from one or more animal reservoirs with probably some human cases being contracted directly from infected animals. At that time, there was no suggestion of pneumonic involvement in human cases.

The originally held ideas of this disease changed rather abruptly in the

period from March 27 to May 17, 1940. During that time 15 clinically similar cases of infection occurred in one of the buildings of the National Institute of Health in Washington, D. C. From 3 of these cases, strains of the infectious agent of Q fever were isolated by Dyer, Topping, and Bengtson.[31] At that time two strains of Q fever were being carried in animals in the building. One of these strains was the original strain from Australia, while the second was the Dyer strain isolated from the first Washington case of 1938.

A careful investigation of the 15 cases at the National Institute of Health revealed little of epidemiological significance. The cases occurred in persons who worked in various sections of the building, with the exception that no cases developed in those employed in the group of rooms in which actual work on Q fever was being carried on. The most reasonable explanation of the absence of cases among those actually exposed in these rooms to animals infected with Q fever lies in the possibility of immunity produced by unrecognized infections. That this might be the correct explanation was suggested by the presence of Q fever rickettsia agglutinins in low titers found in the sera of 6 of the 10 persons working in the Q fever unit as compared to 4 of 20 persons working elsewhere in the building exclusive of those having a recognized infection with Q fever.

There was no evidence that the disease spread in the building by personal contact, nor were there any recognized cases in the families of the patients, nor was there any evidence that an arthropod vector was responsible for the transmission of the infectious agent. However, since the cases were limited to the building in which the disease was being studied, it seemed probable that the disease spread from infected laboratory animals or embryo cultures in some fashion, possibly being carried throughout the building by dust. Later in the year (September to November) 2 additional cases occurred in the same building. From each of these cases the infectious agent was isolated. Transfer of the Washington Q fever laboratory was made to new quarters in 1941. In the winter and spring of 1945 and 1946 (December to May), 47 cases of the disease occurred among the persons working in the building. The epidemiological findings corresponded closely to the indefinite findings of the previous outbreak.[32, 33]

At the time of the first outbreak at the National Institute of Health, the possibility of the presence of similar unrecognized cases in the general population was considered. This seemed possible since the causative agent was probably widespread in nature and since the clinical features of the disease bore a remarkable similarity[34] to the so-called cases of atypical pneumonia which had been reported in the medical literature with increasing frequency since Bowen's[35] report of 1935. Consequently, shortly after the initial outbreak at the National Institute of Health, thorough study was made of two institutional outbreaks of atypical pneumonia in an effort to determine their relationship to Q fever. The results were entirely negative.[36–38]

The cases described in Australia, and the later cases in Washington did not differ materially in the clinical pictures, and this is true of cases subsequently reported from other parts of the world. Additional clinical findings of lung involvement not noted in the Australia cases were brought out in the Washington cases. It is not the purpose of this paper to discuss the clinical picture, but it is important to stress the clinical similarity of Q fever cases with cases of atypical pneumonia. The case fatality rate is very low. Four deaths have been reported in this country to date, and two in Australia. A case fatality rate

less than one per cent is reported for Balkan grippe.

An outbreak resembling influenza occurred in Athens, Greece, in 1943. From a patient in this outbreak, Caminopetros [39] recovered an organism which was later shown to be *C. burnetii*. This disease was shown to be endemic in that area during the war and was called "Balkan Grippe" by the Germans.[40–42]

The presence of the organism in cows' milk has been reported in this country,[43] and in Greece, sheep and goats and their milk have been shown to harbor Q fever.[39] The disease probably exists in other countries in that region—Bulgaria and Roumania.[44, 45]

In 1944 and 1945, Robbins, et al., recognized epidemics of Q fever in the U. S. troops in Italy.[46–48] The findings in the study of these outbreaks confirmed the observations made during the laboratory outbreak at the National Institute of Health in 1940, that person-to-person contact was not important in the transmission of this infection, if, in reality, it ever occurred. This, in spite of the fact that *C. burnetii* has been recovered from the blood, urine, and sputum of patients suffering from the disease.

At about the same time (1945),[49] a strain of the organism of Q gever was recovered from a patient in Panama, the disease apparently being endemic in that area.

Outbreaks of Q fever also occurred among our troops returning from Italy.[50, 51] Comparison of various strains of *C. burnetii* (Australia, America, Balkan grippe, Fort Bragg, Panama, Italy) by Topping, Shepard, and Huebner [52] showed complete cross-immunity in guinea pigs while complement-fixation and agglutinin absorption tests showed similarity in immunological specificity.

In the outbreaks among our troops in Italy, association with domestic livestock, hay, and bedding was noted. Pigeons were numerous around the billets in some instances, but in one instance were absent. Arthropod transmission did not appear likely. It is interesting to note that complement-fixing antibodies were found in the blood sera of a large proportion of the native population in the Italian areas around army troops.

Laboratory cases were also reported at Fort Bragg, North Carolina.[53] In 1947, Caughey and Dudgeon,[54] reviewing 511 cases which had occurred among British and New Zealand troops in the Naples-Caserta area in 1945, with the aid of the complement-fixation test carried out at the National Institute of Health, found that 19 of 20 sera tested were positive for Q fever.

In 1948, Gsell [55] reported cases of illness which had occurred in Switzerland in April, 1947. The identity of these cases with Q fever was confirmed by Cox, using the complement-fixation test. Association with cattle was noted in these cases.

In the United States, although it was realized that the disease was probably present, no evidence of endemicity was obtained until 1946 when outbreaks occurred among abattoir and stockyard workers (reminiscent of the first Australian cases) in Amarillo, Tex.,[56–59] and Chicago, Ill.[60] Again, in these outbreaks, just as in the institutional outbreaks at the National Institute of Health and the Italian epidemics, the most likely mode of infection seemed to be the inhalation of, or contact with, infected material, most probably from infected animals. In this country the disease has also been recognized in Arizona [61] and Montana.[30]

In 1947, cases were recognized in Los Angeles County, California.[62] The first cases were not among abattoir or dairy workers,[63] but practically all gave history of exposure to cows, some of which were found to possess serum antibodies for Q fever. Further studies in Califor-

nia, which are being continued by the California State Department of Public Health, Los Angeles County and Los Angeles City Health Departments, and the U. S. Public Health Service, have shown that *C. burnetii* is present in raw milk[43] produced in the area, but the importance of infected milk as a factor in the transmission of the disease to man is not yet determined. Early experiments indicated that pasteurization eliminated most if not all of the demonstrable infection in milk. Contact with livestock by reason of occupation or residence, at present, seems to be an important factor. This was also suggested by the findings in the Balkan area.

Work has been done in the preparation of vaccines by Cox,[15] Bengtson,[64] and by Smadel.[65] Laboratory experiments indicate their value, but no field data are available as to protecting man against the infection. It should be noted that no cases of Q fever have occurred among laboratory workers who have been vaccinated. Huebner, Hottle, and Robinson[66] have produced some evidence that streptomycin may be of value in treatment.

SUMMARY

In Q fever we have a disease with known potential sources of infection in infected cows, sheep, goats, the milk of these animals, wild animals, and a wide variety of ticks. Epidemiologic studies of the occurrence of Q fever in abattoir workers, laboratory workers, dairy workers, and residents of dairy areas indicate that an important method of transfer of the infection to man is through the medium of contaminated air, whether this be by droplet infection or by dust.

REFERENCES

1. Derrick, E. H. "Q" Fever, a new fever entity: Clinical Features, Diagnosis and Laboratory Investigations. *M. J. Australia*, 2:281 (Aug. 21), 1937.

2. Burnet, F. M., and Freeman, M. Note on a Series of Laboratory Infections with the Rickettsia of "Q" Fever. *M. J. Australia*, 1:11 (Jan. 7), 1939.

3. Smith, D. J. W., Brown, H. E., and Derrick, E. H. A Further Series of Laboratory Infections with the Rickettsia of "Q" Fever. *M. J. Australia*, 1:13 (Jan. 7), 1939.

4. Derrick, E. H., and Burnet, F. M. Personal Communications (1948).

5. Derrick, E. H., Smith, D. J. W., and Brown, H. E. Studies in the Epidemiology of Q Fever. The susceptibility of various animals. *Australian J. Exper. Biol. & M. Sc.*, 18:409 (Dec.), 1940.

6. Burnet, F. M., and Freeman, M. Experimental Studies on the Virus of "Q" Fever. *M. J. Australia*, 2:299 (Aug. 21), 1937.

7. Derrick, E. H. *Rickettsia burneti*—The Cause of "Q" Fever. *M. J. Australia*, 1:14 (Jan. 7), 1939.

8. Derrick, E. H., and Smith, D. J. W. Studies in the Epidemiology of Q Fever. 2. The isolation of three strains of *Rickettsia burneti* from the bandicoot *Isoodon torosus*. *Australian J. Exper. Biol. & M. Sc.*, 18:99 (June), 1940.

9. Smith, D. J. W., and Derrick, E. H. Studies in the Epidemiology of Q Fever. 1. The isolation of six strains of *Rickettsiae burneti* from the tick *Haemaphysalis humerosa*. *Australian J. Exper. Biol. & M. Sc.*, 18:1–8 (Mar.), 1940.

10. Smith, D. J. W. Studies in the Epidemiology of Q Fever. 3. The transmission of Q Fever by the tick *Haemaphysalis humerosa*. *Australian J. Exper. Biol. & M. Sc.*, 18:103 (June), 1940.

11. Davis, G. E., and Cox, H. R. A Filter-Passing Infectious Agent Isolated from Ticks. I. Isolation from *Dermacentor andersoni*, reactions in animals, and filtration experiments. *Pub. Health Rep.*, 53:2259 (Dec. 30), 1938.

12. Parker, R. R., and Davis, G. E. A Filter-Passing Infectious Agent Isolated from Ticks. II. Transmission by *Dermacentor andersoni*. *Pub. Health Rep.*, 53:2267 (Dec. 30), 1938.

13. Cox, H. R. A Filter-Passing Infectious Agent Isolated from Ticks. III. Description of organism and cultivation experiments. *Pub. Health Rep.*, 53:2270 (Dec. 30), 1938.

14. Cox, H. R. Studies of a Filter-Passing Infectious Agent Isolated from Ticks. V. Further attempts to cultivate in cell-free media. Suggested classification. *Pub. Health Rep.*, 54:1822 (Oct. 6), 1939.

15. Cox, H. R. *Rickettsia diaporica* and American Q Fever. *Am. J. Trop. Med.*, 20:463 (July), 1940.

16. Parker, R. R. Unpublished data.

17. Smith, D. J. W. Studies in the Epidemiology of Q Fever. 1. The transmission of Q Fever by the tick *Rhipicephalus sanguineus*. *Australian J. Exper. Biol. & M. Sc.*, 19:133 (June), 1941.

18. Smith, D. J. W. Studies in the Epidemiology of Q Fever. 10. The transmission of Q Fever by the tick *Ixodes holocyclus* (with notes on tick-paralysis in bandicoots). *Australian J. Exper. Biol. & M. Sc.*, 20:213 (Sept.), 1942.

19. Smith, D. J. W. Studies in the Epidemiology of Q Fever. 11. Experimental infection of the ticks *Haemaphysalis bispinosa* and *Ornithodorus sp.* with *Rickettsia burneti*, *Australian J. Exper. Biol. & M. Sc.*, 20:295 (Dec.), 1942.

20. Davis, G. E. American Q Fever. Experimental transmission by the argasid ticks *Ornithodorus moubata* and *O. hermsi*. *Pub. Health Rep.*, 58:984 (June 25), 1943.

21. Parker, R. R., and Kohls, G. M. American Q Fever: The recurrence of *Rickettsia diaporica* in *Amblyomma americanum* in eastern Texas. *Pub. Health Rep.*, 58:1510 (Oct. 8), 1943.

22. Blanc, G., Martin, L. A., and Maurice, A. Sur une Rickettsia isolée de tiqués dans le Sud marocain. Son identité probable avec *R. burneti* agent de la Q Fever. *Compt. rend. Acad. d. sc.*, 223:438 (Sept. 9), 1946.

23. Jellison, W. L., Bell, E. J., Huebner, R. J.

Parker, R. R., and Welsh, H. H. Q Fever Studies in Southern California. IV. The occurrence of *Coxiella burneti* in the spinose ear tick, *Otobius megnini*. *Pub. Health Rep.* 63:1483 (Nov. 12), 1948.

24. Dyer, R. E. A Filter-Passing Agent Isolated from Ticks. IV. Human infection. *Pub. Health Rep.*, 53:2277 (Dec. 30), 1938.

25. Dyer, R. E. Similarity of Australian "Q" Fever and a Disease Caused by an Infectious Agent Isolated from Ticks in Montana. *Pub. Health Rep.*, 54:1229 (July 7), 1939.

26. Bengtson, I. A. Immunological Relationships between the Rickettsiae of Australian and American "Q" Fever. *Pub. Health Rep.*, 56:272 (Feb. 14), 1941.

27. Burnet, F. M., and Freeman, M. A Comparative Study of Rickettsial Strains from an Infection of Ticks in Montana and from Q Fever. *M. J. Australia*, 2:887 (Dec. 16), 1939.

28. Philip, C. B. Comments on the Name of the Q Fever Organism. *Pub. Health Rep.*, 63:58 (Jan. 9), 1948.

29. Hesdorffer, M. B., and Duffalo, J. A. American Q Fever: Report of a probable case. *J.A.M.A.*, 116:1901 (Apr. 26), 1941.

30. Eklund, C. M., Parker, R. R., and Lackman, D. B. A Case of Q Fever Probably Contracted by Exposure to Ticks in Nature. *Pub. Health Rep.*, 62: 1413 (Sept. 26), 1947.

31. Dyer, R. E., Topping, N. H., and Bengtson, I. A. An Institutional Outbreak of Pneumonitis. II. Isolation and identification of causative agent. *Pub. Health Rep.*, 55:1945 (Oct. 25), 1940.

32. Spicknall, C. G., Huebner, R. J., Finger, J. A., and Blocker, W. P. Report of an Outbreak of Q Fever at the National Institute of Health. I. Clinical features. *Ann. Int. Med.*, 27:28 (July), 1947.

33. Huebner, R. J. Report of an outbreak of Q Fever at the National Institute of Health. II. Epidemiological features. *A.J.P.H.*, 37:431 (Apr.), 1947.

34. Hornibrook, J. W., and Nelson, K. R. An Industrial Outbreak of Pneumonitis. I. Epidemiological and clinical studies. *Pub. Health Rep.*, 55:1936 (Oct. 25), 1940.

35. Bowen, A. Acute influenza pneumonitis. *Am. J. Roentgenol.*, 34:168 (Aug.), 1935.

36. Daniels, W. B. Bronchopneumonia of Unknown Etiology in a Girls' School. *Am. J. M. Sc.*, 203:263 (Feb.), 1942.

37. Topping, N. H. Unpublished data.

38. Dyer, R. E., and Topping, N. H. "Q" Fever. A review. *M. Rec. & Ann.*, 36:452 (Nov.), 1942.

39. Caminopetros, J. Q Fever (Balkan grippe). Abstracts of Fourth International Congresses on Tropical Medicine and Malaria, Wash., D. C., May 10–18, 1948. pp. 33–34.

40. The Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Identification and Characteristics of the Balkan grippe strain of *Rickettsia burneti* *Am. J. Hyg.*, 44:110 (July), 1946.

41. Zarafonetis, C. J. D. Virus of "Balkan grippe." Memorandum to the Director, U. S. of America Typhus Commission, dated February 15, 1945.

42. Dennig, H. Q-Fieber (Balkangrippe). *Deutsch. med. Wchnschr.*, 72:369 (July 18), 1947.

43. Huebner, R. J., Jellison, W. L., Beck, M. D., Parker, R. R., and Shepard, C. C. Q Fever Studies in Southern California. I. Recovery of *Rickettsia burnetii* from raw milk. *Pub. Health Rep.*, 63:214 (Feb. 13), 1948.

44. Imhauser, K. Uber das Auftreten von Bronchopneumonien in Sudostraum. *Ztschr. für Klin. Med.*, 142:486, 1943.

45. Combiesco, D., Vasiliu, V., and Dumitresco, N. Identification d'une nouvelle rickettsiose chez l'homme en Roumanie. *Compt. rend. Soc. de biol.*, 141:716 (July), 1947.

46. Robbins, F. C., and Ragan, C. A. Q Fever in the Mediterranean Area: Report of its occurrence in Allied troops. I. Clinical features of the disease. *Am. J. Hyg.*, 44:6 (July), 1946.

47. Robbins, F. C., Gauld, R. L., and Warner, F. B. Q Fever in the Mediterranean Area. Report of its occurrence in Allied troops. II. Epidemiology. *Am. J. Hyg.*, 44:23 (July), 1946.

48. Robbins, F. C., Rustigian, R., Snyder, M. J., and Smadel, J. E. Q Fever in the Mediterranean Area. Report of its occurrence in Allied troops. III. The etiological agent. *Am. J. Hyg.*, 44:51 (July), 1946.

49. Cheney, G., and Geib, W. A. The Ideatification of Q Fever in Panama. *Am. J. Hyg.*, 44:158 (July), 1946.

50. Feinstein, M., Yesner, R., and Marks, J. L. Epidemics of Q Fever among Troops Returning from Italy in the Spring of 1945. I. Clinical aspects of the epidemic at Camp Patrick Henry, Virginia. *Am. J. Hyg.*, 44:72 (July), 1946.

51. Finland, M., and Lesses, M. F. Q Fever: Report of a case. *New England J. Med.*, 237:255 (Aug. 21), 1947.

52. Topping, N. H., Shepard, C. C., and Huebner, R. J. Q Fever: An immunological comparison of strains. *Am. J. Hyg.*, 44:173 (July), 1946.

53. The Commission on Acute Respiratory Diseases, Fort Bragg, N. C. A Laboratory Outbreak of Q Fever Caused by the Balkan Grippe Strain of *Rickettsia burneti*. *Am. J. Hyg.*, 44:123 (July), 1946.

54. Caughey, J. E., and Dudgeon, J. A. "Q" Fever. A serological investigation of a group of cases previously reported as primary atypical pneumonia. *Brit. M. J.*, 2:684 (Nov. 1), 1947.

55. Gsell, O. "Q" Fever (Queensland Fever) in Switzerland. *Schweiz. med. Wchnschr.*, 78 (Jan. 10), 1948.

56. Topping, N. H., Shepard, C. C., Irons, J. V. Q Fever in the United States. I. Epidemiologic studies of an outbreak among stock handlers and slaughterhouse workers. *J.A.M.A.*, 133:813 (Mar. 22), 1947.

57. Irons, J. V., and Hooper, J. M. Q Fever in the United States. II. Clinical data on an outbreak among stock handlers and slaughterhouse workers. *J.A.M.A.*, 133:815 (Mar. 22), 1947.

58. Irons, J. V., Murphy, J. N., Jr., Wolfe, D. M. Q Fever in the United States. III. Serologic observations in an outbreak among stock handlers and slaughterhouse workers. *J.A.M.A.*, 133:819 (Mar. 22), 1947.

59. Cox, H. R., Tesar, W. C., and Irons, J. V. Q Fever in the United States. IV. Isolation and identification of rickettsias in an outbreak among stock handlers and slaughterhouse workers. *J.A.M.A.*, 133: 820 (Mar. 22), 1947.

60. Shepard, C. C. An Outbreak of Q Fever in a Chicago Packing House. *Am. J. Hyg.*, 46:185 (Sept.), 1947.

61. Sussman, O. Unpublished data.

62. Young, F. M. Q Fever in Artesia. *Los Angeles County Health Index*, May 17, 1948.

63. Shepard, C. C., and Huebner, R. J. Q Fever in Los Angeles County. Description of some of its epidemiological features. *A.J.P.H.*, 38:781 (June), 1948

64. Bengtson, I. A. Studies on Active and Passive Immunity in "Q" Fever Infected and Immunized Guinea Pigs. *Pub. Health Rep.*, 56:327 (Feb. 21), 1941.

65. Smadel, J. E., Snyder, M. J., and Robbins, F. C. Vaccination against Q Fever. *Am. J. Hyg.*, 47:71 (Jan.), 1948.

66. Huebner, R. J., Hottle, G. A., and Robinson, E. B. Action of Streptomycin in Experimental Infection with Q Fever. *Pub. Health Rep.*, 63:357 (Mar. 19), 1948.

Q Fever

Experimental Q Fever in Cattle * †

E. J. BELL, Sc.D., R. R. PARKER, PH.D., AND H. G. STOENNER, D.V.M.

Scientist (R), and Director, Rocky Mountain Laboratory, U. S. Public Health Service; and Assistant Veterinarian, Communicable Disease Center, U. S. Public Health Service, Hamilton, Mont.

THE purpose of this paper is to present briefly some of the results obtained following the inoculation, or other controlled exposure, of cattle to *Coxiella burnetii*, the causal agent of Q fever.

Much of the evidence derived from epidemiologic studies of Q fever has emphasized the importance of contact with livestock as a means of human infection. The Australian investigators were the first to note that the disease occurred primarily among dairy farmers and abattoir workers.[1, 2] In the United States, the naturally occurring outbreaks in Amarillo, Tex.,[3] and in Chicago, Ill.,[4] were also associated with stockyards and slaughter-houses. Furthermore, it seemed clear from studies of these latter outbreaks that infected cattle in Amarillo and infected calves or sheep in Chicago had been the source of human infection.

The occurrence of natural Q fever infection in cattle was first indicated serologically,[1, 5] and was later confirmed [6] by the recovery of *C. burnetii* from raw milk of several dairies in Los Angeles County, California. As might be expected from these findings and from the epidemiologic observations noted above, this disease was found to be endemic in Southern California.[7] Studies of over 150 human cases in this area revealed that 40 per cent had had some contact with livestock.

Although the importance of cattle as a source of human infection seems established, the epizoölogy of this disease is not obvious, nor is it clear by what means infection may be transmitted from cattle to man. With these questions in mind, controlled laboratory studies of the experimental infection of cattle with Q fever were initiated. It was believed that information derived from such studies might be of considerable value, especially in planning investigations of this disease as it occurs in nature.

Experimental infection of cattle with Q fever has been reported previously by Derrick, Smith, and Brown [1] in 1942 in Australia and by Blanc, *et al.*[8] in 1948 in Morocco. The Australian investigators reported the results of the subcutaneous inoculation of two calves with infected guinea pig tissue. Both calves manifested a mild febrile reaction for one day, the 3rd day after inoculation. One was sacrificed on the 4th day and *C. burnetii* was recovered from the spleen and liver. The infective agent was also recovered from a 4th day blood specimen of the second calf, and Q fever antibodies were detected in its serum from the 11th to the 29th day. Blanc

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 12, 1948.

† From the Rocky Mountain Laboratory, Division of Infectious Diseases, National Institutes of Health, and the Communicable Disease Center, U. S. Public Health Service.

and his associates, working in Morocco, state that they were able to infect cattle with this disease, and that these animals showed a mild febrile reaction followed by the development of agglutinating antibodies for *C. burnetii*.

METHODS AND MATERIALS

A more detailed description of the experiments to be reviewed in this paper is included in other manuscripts now in press or in preparation for publication. The various materials obtained from experimental cattle were tested for infectivity by injecting them into guinea pigs. Guinea pigs were bled approximately 30 days after inoculation and their sera tested for Q fever antibodies by the complement-fixation test. Subsequent to bleeding, the animals were tested for immunity by inoculation with a known strain of Q fever. The development of antibodies in the sera of guinea pigs and immunity to reinfection with *C. burnetii* were regarded as evidence that the material injected was infected. Prior to inoculation, the cows were shown not to have specific serum antibodies and their milk and blood were shown not to be infectious for guinea pigs.

EXPERIMENTAL

Studies of experimental Q fever in cattle were begun at the Rocky Mountain Laboratory in 1947.[9, 10] The initial work involved attempted infection of 4 heifers which were inoculated by different routes, namely, intranasal, intravenous, by way of the alimentary tract, and by way of the vaginal tract. Specimens of blood, nasal washings, feces, and urine, taken at 5 day intervals for a period of one month, were tested for infectiousness in guinea pigs. Results of these four experiments were apparently negative.

Subsequent to these initial studies, additional experiments involving 9 lactating cows, 2 male calves, and 1 heifer, have been undertaken. Seven of the cows were inoculated with Q-fever-infected yolk-sac cultures, and 2 were hosts to experimentally infected ticks. The calves were fed infected milk. The heifer was tested by instillation of the inoculum into the conjunctival sac. A summary of the results of tests so far completed for these experiments follows.

Experiment 1—In November, 1947, infection was readily produced in 2 milk cows, Nos. 1 and 2, following udder inoculation of massive doses of a yolk-sac culture of the Nine Mile strain. Three of the quarters of the udder of cow No. 1 were inoculated as follows: one by way of the teat canal, one via the mammary gland, and one subcutaneously. Only a single quarter of cow No. 2 was inoculated via the teat canal. Milk specimens from all four quarters of both cows were tested at least once a week up to the present time. Milk from uninoculated quarters has not become infectious.

Foremilk or strippings from the single inoculated quarter of cow No. 2 were infectious through the 48th day. All specimens in subsequent tests performed for a period of more than 181 days have been negative.

Tests of similar specimens from the three inoculated quarters of cow No. 1 demonstrated that milk from the quarter inoculated by way of the teat canal was infectious for 17 days; that from the one inoculated via the glandular tissue was infectious for over 200 days; while that from the quarter inoculated subcutaneously remained non-infectious.

Tests of at least 12 specimens each of the blood, feces, urine, and nasal washings, taken from each cow during the first month after inoculation, were consistently negative. Daily rectal temperatures taken for a period of over 2 months did not reveal a significant temperature rise in either of the two animals. Complement-fixing antibodies for Q fever appeared in the serum of both

cows about the beginning of the 2nd week. In subsequent tests, the serum of cow No. 1, which has continued to shed rickettsiae in its milk, has remained positive. In contrast, tests for Q fever antibodies in the serum of cow No. 2, whose milk has been non-infectious since the 48th day, yielded inconsistent and questionable results after about the 60th day. Since that time, the antibody titer of this cow appears to have dropped below a significant diagnostic level.

Experiment 2—In a third lactating cow, a heavy inoculum, consisting of a yolk-sac culture of a California strain (recovered from milk of a naturally infected cow) was introduced into the cervical canal. Pooled aliquots of first-milk samples from the four quarters were tested for infectiousness at 2 day intervals until the 20th day and thereafter at intervals of twice a week.

During the first 18 days postinoculation, only three of ten milk samples were positive, those of the 6th, 10th, and 18th days. However, nearly all specimens taken from the 18th through the 160th days have been positive. Individual milk specimens from each of the four quarters, which had been routinely frozen and stored at —70° C. during this experiment, were thawed and retested separately. These tests revealed that the left front quarter was the only quarter secreting infectious milk.

Specimens of urine, examined for a period of 80 days, were positive on each of the first 8 days, but were negative in all subsequent tests. Specimens of blood taken each day for the first 10 days and thereafter at intervals of at least 5 days were consistently negative. Daily rectal temperatures which were taken for a period of 6 weeks revealed no significant temperature rises.

Q fever antibodies, as detected by the complement-fixation test, appeared in the serum of this cow, and have been consistently present at relatively high levels through the 191st day postinoculation.

Development of infection in the mammary gland of this cow is an interesting observation. The means by which this occurred, however, is a matter of speculation. Contamination of the orifice of the teat by infected urine present on the floor or bedding is possible, since the urine was infectious during the first 8 days postinoculation. The infectious agent in the urine is believed to have been derived by contamination from the inoculum which may have been present in the more external region of the vaginal tract. That infection in the udder was not blood-borne is suggested by the failure to detect the presence of rickettsiae in this material.

Experiment 3—This experiment was planned primarily for the purpose of determining the symptomatology and pathology of Q fever in lactating cows. Six cows were used, 4 of which were inoculated with large amounts of a 10 per cent suspension of an infected yolk-sac culture of the same California strain of *C. burnetii* used in the previous experiment. The remaining 2 served as controls and were injected with a corresponding amount of normal yolk-sac tissue. The inoculum was introduced through the teat canal of the two left quarters of the udder of each cow. Infected cows were sacrificed on the 5th, 11th, 22nd, 63rd days after inoculation. At autopsy, numerous tissue specimens were obtained and fixed for histopathologic study, and portions of the same tissues were stored at —70° C. for subsequent inoculation into guinea pigs. During the period before the animals were sacrificed, samples of milk and blood were tested for infectivity in guinea pigs. Milk was tested three times a week, while the blood was tested each day for the first 10 days, and thereafter three times a week. Detailed laboratory tests, including hematological studies, urine analysis, and chemical analysis of

the milk, were conducted three times a week. Clinical observations were made daily.

C. burnetii was isolated from the blood of all 4 test cows on two or more of the first 5 days, but not from blood taken after this time. Milk from all but one of the injected quarters was infectious from the 1st day after inoculation until the date of sacrifice. In the exceptional case, milk from the left front quarter of the cow sacrificed on the 63rd day became non-infectious on the 44th day. In this same cow, milk from one of the non-inoculated quarters became infectious on the 7th day. Repeated titration in guinea pigs of milk from a single quarter of the cow sacrificed on the 63rd day revealed the presence of rickettsiae in dilutions of at least 10^{-5} and 10^{-4} on the 2nd and 7th days post-inoculation, respectively, and thereafter at 5 day intervals at a dilution of only 10^{-1}.

Following inoculation with *C. burnetii*, an acute mastitis accompanied by a marked systemic reaction was produced. The mastitis during the acute phase was characterized clinically by marked swelling, subcutaneous edema, feverishness, enlargement of supramammary lymph glands, and evidence of pain upon palpation of affected quarters. Microscopic examination revealed a marked increase in the cellular constituents of the milk from infected quarters. The cell count of foremilk rose to a peak of 20 to 30 million per cu. ml. and consisted chiefly of polymorphonuclear leukocytes. During the acute stage of the mastitis, temporary metabolic changes in the activity of the mammary gland were manifested by variations in the content of certain of the constituents of the milk. Among these fluctuations observed were a marked increase in butter fat concentration, increase in chlorides, decrease in lactose, and a marked decrease in total daily milk production. No significant change was noted in the pH of the milk. Recovery from the acute phase of the mastitis was spontaneous. In general, the major symptoms and other changes had disappeared by about the 8th day after inoculation.

The systemic reaction was of brief duration and preceded and accompanied the acute mastitis. It was characterized by a marked pyrexia, slight serous nasal and lacrimal discharges, moderate to severe depression, partial inappetence, infrequent rumination and shallow rumen movements, moderate tachycardia, and a moderate polypnea accompanied only by a definite increase in vesicular murmur. Examination of the blood revealed no marked changes in its cellular constituents, hemoglobin content, or sedimentation rate. No evidence of kidney pathology was revealed by urinalyses conducted at various intervals during the acute and chronic stages of the infection.

Tissues obtained at autopsy and stored at −70° C. were subsequently tested for infectiousness in guinea pigs. Although many of these tests are incomplete, a brief summary will be given of the results to date. Among the specimens tested were the lung, liver, spleen, kidney, heart, brain, adrenal gland, lymph nodes, intestinal tract, and mammary gland. Of those tested from the cow sacrificed on the 5th day, practically all were positive. It should be recalled, however, that the blood of this cow was also infectious on this day. A second cow was sacrificed on the 11th day. Although its blood was negative on each of the 5 days prior to sacrifice, nevertheless, a number of tissues from this cow were positive. Included among the positive tissues were the lung, liver, spleen, the right and left supramammary lymph glands, and the mammary gland tissue taken from the inoculated quarters. Negative results were obtained in a single test of the kidney, heart, and mammary gland tissue taken from the non-inoculated quarters of the udder.

Gross pathology in the sacrificed cows was confined chiefly to the mammary gland and regional lymph glands. In the cow sacrificed on the 5th day, the inoculated quarters were very edematous, with heavy serous accumulations in the subcutaneous tissue of the udder. A marked serous lymphadenitis was noted in the left supramammary and left deep inguinal lymph nodes. Although rickettsiae were recovered from most of the tissues tested to date from this cow, there was little or no pathology observed in other organs. In the cows sacrificed on the 11th and 22nd days postinoculation, the outstanding lesion was a serous lymphadenitis of the left supramammary and left deep inguinal lymph glands. As the infection had become established in the right rear quarter of the cow sacrificed on the 63rd day postinoculation, both supramammary glands were enlarged and edematous.

The 2 control cows in this experiment were used to detect tissue reactions to the normal yolk sac and to detect changes in milk production and composition due to experimental conditions. The normal yolk-sac suspension excited a tissue reaction which was reflected in changes in chemical composition and cellular constituents of the milk. This reaction was of a transitory nature, and changes in production and milk composition were not of the magnitude observed in the infected cows. The control cows remained afebrile and manifested no systemic reaction to the nonspecific mastitis. Weekly injections of milk into guinea pigs and complement-fixation tests of sera of these cows revealed no spontaneous Q fever infection during the course of the experiment.

Experiment 4—This experiment was conducted to determine whether unweaned calves would become infected following ingestion of Q fever infected milk. Infectious milk from cows used in the previous experiment was fed by pail to 2 calves, aged 3 weeks and 3 months, respectively. The milk used was a pool made up of approximately equal portions of infected and normal milk. Each calf received about 6 liters of the pooled milk per day, one until sacrificed, and the other for a period of more than 30 days. The 3 month old calf became febrile on the 13th day after its first infective feeding and was sacrificed on the following day while still febrile. Q fever developed in guinea pigs injected with 4th, 6th, and 12th day blood specimens and an 8th day fecal specimen. Of the tissues obtained at autopsy, only animals injected with the prescapular lymph node and abomasum developed Q fever.

No symptoms were observed in the 2nd calf, although Q fever developed in the guinea pigs injected with 4th and 13th day blood specimens and in those receiving 2nd, 6th, 10th, and 14th day feces. Tests of nearly all fecal specimens taken during the first 20 days, other than those reported above as positive, were rendered valueless by intercurrent bacterial infections of the injected guinea pigs. Tests of urine specimens from both calves were consistently negative.

Based on tests completed to date, it is uncertain whether infection was produced in these calves. The febrile reaction in one of them and the development of Q fever in guinea pigs injected with some of the daily blood specimens from each calf are suggestive of infection in the calves. However, the question of spontaneous infection [11] in the test guinea pigs must be considered. This is suggested by the observations that the blood-injected guinea pigs developing Q fever represented intermittent and not consecutive blood specimens and that guinea pigs receiving only two of the numerous tissues tested from this calf sacrificed while febrile became ill with this disease. In order to demonstrate definitely the presence of *C. burnetii*,

tissues of this calf are being cultured in the yolk sacs of fertile hen's eggs.

Q fever antibodies were not demonstrated in the serum of the surviving calf. This apparent failure to develop specific antibodies may have been due to the young age of this calf.

Additional experiments — Transmission of Q fever to cows by infected ticks of the species *Otobius megnini* Dùges is being attempted. Results to date are indefinite. The only evidence of successful transmission has been the apparent development of Q fever antibodies in the serum of one of the cows. These antibodies appeared about the 3rd week after infestation of the cow with infected ticks, and were present in significant titers from the 20th to 30th days. In later tests the serum antibody titers were low and irregular. Since rickettsiae have not been recovered from blood or milk specimens tested periodically for more than 2 months, it cannot be safely assumed that this cow was infected. Further experiments along this line are to be conducted.

In another experiment, infection of a heifer was attempted by instillation of Q-fever-infected yolk-sac material into the conjunctival sac. The only evidence suggestive of infection was the appearance of specific serum antibodies on about the 7th day postinoculation.

DISCUSSION

Knowledge of the route or routes by which cattle become infected with Q fever in nature is important. Of interest in this respect is the finding that infection is readily produced in the udder of lactating cows following exposure of the mammary gland to *C. burnetii*, and that the rickettsiae are eliminated in milk from the infected quarters for long periods of time. Moreover, attempts to infect cattle by other routes were less definitely successful. The latter results were obtained in heifers, and a single strain of *C. burnetii* was used for inoculation. They are, therefore, inadequate as a basis for comparing the various routes of inoculation for their ease of producing infection. Further tests employing lactating cows and other strains of the rickettsia should be conducted.

In studies [6] of naturally infected cows, clinical symptoms were not observed, and although *C. burnetii* has been isolated from the milk, mammary glands, and supermammary lymph nodes of such animals, it has not been recovered from the blood or other tissues. Whether these observations were made during the acute or chronic stage of the disease is not known. However, that definite clinical symptoms and the presence of *C. burnetii* in the blood and other extramammary tissues may occur during the acute stage of the infection in cows under natural conditions is suggested by the results observed in the experimental disease. In the latter, there was an acute mastitis and a marked systemic reaction for a relatively brief period, yet rickettsiae were recoverable from the mammary gland or its secretion for relatively long periods after inoculation. In addition, rickettsiae were recovered from the blood and numerous other extramammary tissues during the acute stage of the disease. It should be recalled, however, that massive infective doses of *C. burnetii* were employed in these experiments. Whether use of smaller doses more closely approaching conditions expected to occur in nature would yield similar results is not known. Nevertheless, the experimental findings indicate the desirability for further studies under natural conditions.

In the present studies it was found that Q fever rickettsiae were recoverable from the feces of calves ingesting infected milk. It has not been determined whether the presence of *C. burnetii* in this material represents an elimination of the agent following infection of the calf, or merely its passage through the ali-

mentary tract following ingestion of infected milk. Nevertheless, the experimental observation suggests that the feces of calves feeding on infected milk in a natural environment may be concerned with the spread of Q fever among cattle and from cattle to man.

SUMMARY

Q fever infection in lactating cows has been produced consistently by inoculation of *Coxiella burnetii* via the lactiferous duct. Rickettsiae were found in the milk of these cows for long periods of time, in some cases for over 200 days after inoculation. Exposure of the mammary gland to massive doses of a yolk-sac culture of *C. burnetii* excited an acute mastitis accompanied by a marked systemic reaction. These symptoms appeared to be of brief duration, and recovery was spontaneous, yet rickettsiae continued to be shed in the milk. In animals showing these symptoms, rickettsiae were recovered from the blood during the acute period, and from numerous other tissues obtained from cows sacrificed at various intervals up to 63 days after inoculation.

Q fever rickettsiae were recovered from the feces of calves feeding on infected milk. However, infection by this method was not definitely proved.

Experiments involving attempts to infect cattle by other routes of inoculation and by infestation with infected ticks *(Otobius megnini)* are described.

REFERENCES

1. Derrick, E. H., Smith, D. J. W., and Brown, H. E. Studies in the Epidemiology of Q Fever. 9. The Role of the Cow in the Transmission of Human Infection. *Australian J. Exper. Biol. & M. Sc.*, 20: 105–110 (June), 1942.

2. Derrick, E. H. The Epidemiology of Q Fever. *J. Hyg.*, 43:357–361 (Apr.), 1944.

3. Topping, N. H., Shepard, C. C., and Irons, J. V. Q Fever in the United States. I. Epidemiologic Studies of an Outbreak among Stock Handlers and Slaughterhouse Workers. *J.A.M.A.*, 133:813–815 (Mar. 22), 1947.

4. Shepard, C. C. An Outbreak of Q Fever in a Chicago Packing House. *Am. J. Hyg.*, 46:185–192 (Sept.), 1947.

5. Shepard, C. C., and Huebner, R. J. Q Fever in Los Angeles County. Description of Some of Its Epidemiological Features. *A.J.P.H.*, 38:781–788 (June), 1948.

6. Huebner, R. J., Jellison, W. L., Beck, M. D., Parker, R. R., and Shepard, C. C. Q Fever Studies in Southern California. I. Recovery of *Rickettsia burnetii* from Raw Milk. *Pub. Health Rep.*, 63:214–222 (Feb. 13), 1948.

7. Beck, M. Dorthy. Q Fever. *California's Health*, 5:333–335 (Mar. 31), 1948.

8. Blanc, G., Bruneau, J., Martin, L.-A., and Maurice, A. Quelques donnée Nouvelles sur le Virus de la Q Fever Marocaine. *Compt. rend. Acad. d. Sci.*, 226:607–608 (Feb. 16), 1948.

9. Parker, R. R., Bell, E. J., and Lackman, David B. Experimental Studies of Q Fever in Cattle. I. Observations on Four Heifers and Two Milk Cows. *Am. J. Hyg.*, 1948. (In Press.)

10. Parker, R. R., Bell, E. J., and Stoenner, H. G. Q Fever: A Brief Survey of the Problem. *J. Am. Vet. M. A.*, 1948. (In Press.)

11. Huebner, R. J. Report of an Outbreak of Q Fever at the National Institute of Health. II. Epidemiological Features. *A.J.P.H.*, 37:431–440 (Apr.), 1947.

1948 International Red Cross Meeting

A report by Basil O'Connor, President of the American National Red Cross, is now available of the first meeting of the International Red Cross since 1938. This was the 17th International Red Cross Conference held in Stockholm in August, 1948.

The conference is the highest deliberative body of the International Red Cross world and is made up of the International Committee, the 66 national Red Cross society members of the League of Red Cross Societies, and the 72 government signatories to the Geneva Conventions.

The report is available from the American National Red Cross, Washington 13, D. C.

Q Fever

Q Fever Survey in Southwest Texas *

J. V. IRONS, Sc.D., F.A.P.H.A., AND JOSEPH N. MURPHY, JR., M.S.P.H.S.

Texas State Health Department, Austin, Tex.,

AND

A. B. RICH, D.V.M., AND AUSTIN E. HILL, M.D., M.P.H., F.A.P.H.A.

City Health Department, San Antonio, Tex.

AFTER the occurrence of the March, 1946, outbreak of Q fever at Amarillo, Tex., the Texas State Health Department continued to search, particularly by laboratory procedures,[3, 4] for other cases. Because of the relative scarcity of ticks[1] and apparently negative findings on cattle sera[5] in this area it seemed probable that more promising areas for investigation of Q fever in Texas could be found. *Coxiella burnetii* had been demonstrated in pools of ticks collected in southeast Texas in 1937[6] and later at Camp Bullis near San Antonio.[7] Evidence of this infection in packinghouse workers at Fort Worth has also been reported.[8]

In February, 1948, a survey of packinghouse workers at San Antonio, Tex., was begun. It was planned to search for cases of Q fever in several communities in southwest Texas. A search of raw milk samples for *C. burnetii,* the causative agent of Q fever, was also begun.

In much of southwest Texas, the people are to a considerable extent of Latin-American descent, and the Negro population is low. Ranching and diverse farming activities provide occupations for many, and toward the Rio Grande Valley the climate is subtropical and suitable for winter gardening. In the lower Rio Grande Valley citrus orchards are abundant.

Methods of Investigation—Through the coöperation of several local physicians the names of persons who had undergone recent febrile attacks were obtained. Cases of "virus pneumonia" especially were sought. Blood samples were taken by local physicians, or persons were visited, interviewed, and blood samples were obtained by us. Upper respiratory infection constituted the main group of illnesses to be differentiated from Q fever in the spring, while typhus more often was considered in the summer.

The complement-fixation test was of great help in the recognition of Q fever. For the most part the complement-fixation antigen was prepared from the Italian (Henzerling) strain of *C. burnetii,* but the Nine Mile antigen was also utilized on some occasions. Survey bloods from slaughter-house workers and food handlers, as well as milk samples, were obtained in connection with routine tests. All sera were examined in a "screen" test, with a single tube at a 1:10 or 1:20 dilution. All positive tests were repeated quantitatively.[3] The titer was expressed as the highest dilution at which 3+ or 4+ fixation was seen. Blood clots and milk samples to be

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 12, 1948.

TABLE 1

Epidemiological and Clinical Findings With Twelve Cases of Q Fever

Case No.	Age	Occupation	Date of Onset of Illness	Duration of Fever (Days)	Symptoms at Onset	Cough	Expectoration	X-ray
1	24	Butcher	11-10-47	10	Headache, malaise	+	−	
2	20	Butcher	11-24-47	4	Headache, nausea	−	−	
3	40	Butcher	12-17-47	10	Malaise	++	+	Atypical pneumonia
4	35	Butcher	12-18-47	8	Headache, malaise	++	+	Pneumonitis, or atypical pneumonia
5	43	Butcher	12-23-47	3	Malaise	+	−	
6	19	Butcher	12-25-47	6	Headache, chills	++	+	Atypical pneumonia
7	28	Postal clerk	3- 3-48	12	Headache, nausea	++	+	Atypical pneumonia
8	78	Rancher	4- 1-48	21	Malaise	++	++	
9	28	Construction worker	5- 2-48	5	Headache, malaise	+	−	
10	40	Machinist	9- 6-48	9	Malaise, nausea	+	+	Pneumonitis, or atypical pneumonia
11	19	Laborer	9-20-48	7	Headache, malaise	+	−	Pneumonitis
12	31	Housewife *	10- 1-48	12	Malaise	+	−	

* All others were males.

tested for *C. burnetii* [4] were stored in duplicate in the frozen state, so that all positive tests could be repeated. Mice, hamsters, or guinea pigs were used for isolation of *C. burnetti.*

Investigation of a Small Outbreak of Q fever in Packinghouse Workers at San Antonio—Almost immediately as a result of the survey in packinghouse workers at San Antonio, a serum showing a very high titer for Q fever was encountered. Upon inquiry the recent occurrence of "virus pneumonia" in workers on the killing floor of one of the major packinghouses at San Antonio was revealed. Three cases, all showing unusually high Q fever titers readily were located. (Cases 3, 4, and 6 in Tables 1 and 3). Case 3 was the general foreman on the killing floor and had become ill December 17. Case 4 was supervisor of the tankage department and had become ill December 18. Case 6 worked in the beef cooler and had become ill December 25. Other members of their families had not been ill. Since the dates of onset were grouped closely it appeared probable that there had been a common source of exposure, and that some of the livestock butchered had been the source. In view of reports [9, 10] on the incubation period in Q fever it appeared that exposures were in late November or early December, 1947. Approximately 80 persons were employed on the killing floor and conceivably a somewhat larger number could have been exposed. During the probable exposure time there had been days when several butchers were absent. None of those ill in December could recall removing ticks from themselves. Hogs, sheep, goats, and cattle had been butchered in late November and early December. Sheep and goat carcasses also passed through the "beef cooler." Since hogs are not handled in the "beef cooler" they were probably not involved. The subsequent serologic survey revealed only one more butcher (case 5 in Tables 1 and 3) who evidently was exposed and became ill December 23. Perhaps others with low titers, as shown in Table 2, were exposed in late November or early December, and had inapparent infections in December, 1947. The low attack rate suggested that the source of infection was not widely disseminated, or perhaps that some workers had been exposed in previous years.

Serologic Survey of Q Fever in Slaughter-house Workers at San An-

TABLE 2

Q Fever Complement-Fixation Titers With Sera from Packinghouse Workers at San Antonio, Texas

Packinghouse	No. Sera Tested	No. Negative	No. Sera With Titer					
			1:10	1:20	1:40	1:80	1:160	1:320
1	190	182	3	..	1	1*	..	3*
2	182	172	3	4	1	1	..	1
3	148	140	..	2	4	..	1†	1†
4	96	94	2	..	..	..	..	..
5	94	92	..	1	1	..	..	..
6	85	81	2	4	1	..	..	..
7	79	73	1	1	4	..	..	..
8	71	70	1	..	..	..	..	..
9	62	59	2	1	..	..	..	..
10	59	58	..	1	..	..	..	..
11	52	49	1	..	1	1	..	..
12	49	46	2	..	1	..	..	..
All Others	86	79	2	2	1	1	..	1
Totals	1,256	1,195	19	16	15	4	1	6

* December 17–25, 1947, outbreak
† November, 1947, cases

tonio—The majority of sera were from persons working on or about the killing floors. Practically every slaughter-house in San Antonio was included in the survey. There was a great majority of men in various age groups and mostly with Latin-American names.

Approximately 5 per cent of these sera had a titer of 1:10 or more, and approximately 2.8 per cent had a titer of 1:20 or more, as shown in Table 2.

The individuals with Q fever antibodies mainly were butchers and were scattered among several plants. There was no clear evidence that any particular job on the killing floor was most hazardous. There was some evidence that those few who worked exclusively with hogs were found less often to be reactors. However, it is doubtful that any epidemiological significance could be attached to this observation, because of lack of definite information on workers' activities in relation to exposures.

In the five packinghouses where the higher titers were found, the men were interviewed and absentee records were reviewed for dates of any illnesses during 1947 or 1948. While the results were impossible to evaluate in some instances, it seemed evident enough that two butchers (cases 1 and 2) employed by a second large packinghouse had Q fever in November, 1947. There seemed to be a good possibility that cases 1 and 2 were exposed during the course of their work, perhaps on the same occasion, late in October or early in November, 1947, when both men assisted with butchering cattle, sheep, goats, and hogs. There was no evidence that any others of the 50 men on the killing floor, or others who conceivably were exposed, had been ill in November, 1947.

Serologic Survey of Q Fever in Food Handlers at San Antonio—Five hundred and sixty-five sera from food handlers at San Antonio were examined by the "screen" test for Q fever. This group was similar to the slaughter-house workers' group except for differences in occupation. The group comprised a great preponderance of males of various age groups mainly with Latin-American names. Five hundred fifty-six of these sera were not reactive in the 1:10 serum dilution. Seven showed 4+ at 1:10 and two at 1:20 serum dilution.

Recognition of Scattered Cases of Q Fever in Southwest Texas—Table 1 lists the clinical cases of Q fever which have been found by preliminary investigations in San Antonio and other widely scattered communities in southwest

Texas. The diagnosis of Q fever in each case was based on clinical and confirmatory laboratory findings. The typical clinical history was the same as that described by others.[2, 5, 10] The onset was acute with fever, headache, chills or chilly sensations, and body aches or pains. Chest discomfort was common, and cough was frequently complained of but was not a prominent symptom. Physical examination usually revealed little of note. There was no rash. Chest plates frequently revealed an atypical pneumonic process. The leucocyte count tended to be normal or only slightly elevated. The febrile period usually persisted 1 to 2 weeks and convalescence was prolonged especially in older patients. No deaths occurred.

When the patient was seen in the acute phase of illness, blood was obtained both for antibody test and animal inoculation. Another blood specimen was sought late in the illness or after recovery for possible rise in antibody titer. It was believed that diagnosis was most firmly established by demonstration of a marked rise in antibody titer or recovery of *C. burnetii*. Some patients had recovered when the history notes and blood specimens were obtained, so that the criteria for recognition of Q fever rested on typical clinical history and demonstration of complement-fixing antibodies in high titer, as shown in Table 3.

Since the patients were contacted mainly after the acute phase of illness, the isolation of *C. burnetii* was successful only with case 7. This strain appeared to be typical of the Q fever organism. It caused an enlarged spleen in which the characteristic organisms were demonstrable. Mice developed complement-fixing antibodies in high titers, both with antigens prepared from American (Nine Mile) and Italian (Henzerling) strains of *C. burnetii*.

Epidemiologic Findings on Scattered Cases of Q Fever in Southwest Texas—From Table 1 it is seen that the age of confirmed clinical cases varied from 19 to 78 years. With the exception of case 12 all were men. However, this is of doubtful significance because of the possibility of poor sampling. The cases occurred from November, 1947, to October, 1948, and were still occurring. It seems likely that Q fever has been present for some time. No seasonal in-

TABLE 3

Laboratory Findings With Twelve Cases of Q Fever in Southwest Texas, 1947–1948

Case No.	Date of Onset of Illness	Bleeding Dates 1948	Complement-Fixation Titers					
			1:20	1:40	1:80	1:160	1:320	1:640
1	11-10-47	4- 5-48	4	4	4	4	3	—
2	11-24-47	4- 5-48	4	4	4	3	—	—
3	12-17-47	2-25-48	4	4	4	4	4	4
4	12-18-47	2-25-48	4	4	4	4	4	4
	"	3-19-48	4	4	4	4	4	4
5	12-23-47	5- 4-48	4	4	4	4	—	—
6	12-25-47	2-10-48	4	4	4	4	4	4
7	3- 3-48	3-11-48 *	—	—	—	—	—	—
	"	3-18-48	4	4	4	—	—	—
	"	4- 2-48	4	4	4	4	4	4
	"	8-30-48	4	4	4	+	—	—
8	4- 1-48	4-24-48	4	4	4	4	4	4
9	5- 2-48	9-24-48	4	4	4	4	3	—
10	9- 6-48	9-10-48	—	—	—	—	—	—
	"	9-15-48	—	—	—	—	—	—
	"	9-27-48	4	4	4	4	4	4
11	9-20-48	10- 7-48	4	4	4	4	4	4
12	10- 1-48	10-11-48	4	4	4	4	—	—
	"	10-21-48	4	4	4	4	4	4

* *C. burnetii* was recovered from the clot

cidence is as yet evident. The cases are listed in Tables 1 and 3 in chronological order.

While cases 1 through 6 were butchers, no common epidemiologic factor in cases 7 through 12 is as yet evident. Three cases claimed they drank only pasteurized milk. It is interesting that case 7 claimed he drank only pasteurized milk, but it was learned that the cafe which served the coffee that he and his coworkers at the local postoffice drank several times daily served raw cream with the coffee. Some worked with livestock while others neither worked with, nor lived very near livestock. Working with goats and sheep rather than cattle seemed to be of probable significance in case 8. The possibility of infection from tick bite as a common factor is difficult to rule out, but, with one exception, none could recall recent tick bite before onset of illness. The location of these cases over a wide area is of particular interest.

Demonstration of Complement-fixing Antibodies in Sera from Goats and Sheep—The possibility that case 8 had acquired infection on the W. C. ranch seemed excellent. This man had been working daily with large numbers of goats and frequently with the much smaller flock of sheep on the W. C. ranch. He could not recall seeing any ticks around the sheep or goats. There was a lone cow and her calf on the ranch. Blood specimens were collected from the cow and calf, from three sheep, and approximately in equal numbers from goats raised on the W. C. ranch and from a few truck loads brought to the ranch the previous fall from two other distant ranches. Sera from the cow and calf were negative. It should be mentioned that results of tests on sera from cattle elsewhere have been difficult to interpret since titers found so far have been consistently very low. One of three sera from sheep and eight of fifteen sera from goats, including bearers of each of the three brands, showed the presence of antibodies. Each of the five sera from goats raised on the W. C. ranch showed a titer, ranging from 1:10 to 1:160.

The Demonstration of C. burnetii in Raw Milk and Its Possible Significance in Epidemiology of Q Fever—Raw milk samples were received on ice from several communities in southwest Texas usually in connection with routine tests according to A.P.H.A. Standard Methods. Duplicate tubes on each sample were stored in a deep freeze box until the result of the "screen" test for Q fever on a pool of samples became known. Six to fifteen (with an average of ten) samples from as many dairies were included in a pool. Routine samples were picked up on delivery routes or collected from bulk milk either at the dairy or the processing plant before pasteurization. Specimens collected by us were taken at the dairy either from individual strippings or from pools of small strings of cows. One ml. of milk was inoculated intraperitoneally in each of four mice, or occasionally 2–5 ml. of milk was inoculated in a hamster or guinea pig. In some few instances small doses of penicillin were given. One or two mice were sacrificed at 10 days and their spleens were saved in a deep freeze box. The remainder were bled at 21 or 30 days for complement-fixation test. Passages were not attempted with 10 day spleens as a rule unless a mouse for 21 or 30 day bleeding was not available or showed a titer. Serial bleedings were attempted on hamsters and guinea pigs. Two of seventy tests on pools gave unequivocal positive results. Likewise, unequivocal results were obtained on one sample each from the components of the two positive pools and involved two widely separated dairies in southwest Texas.

DISCUSSION

A small outbreak of Q fever in butchers employed by one of the larger

San Antonio slaughter-houses was encountered as a result of a survey. This outbreak was explosive and occurred in December, 1947. While it seemed evident that the infections were acquired in the course of work, it was impossible to assess the relative importance of cattle, sheep, and goats as the probable source of infection. Since three of the four men ill showed evidence of pneumonitis or atypical pneumonia, the possibility of infection from inhalation was suggested. The low attack rate suggested that exposure was limited or that some workers were immune. The relatively low attack rate perhaps was more typical of the picture in Australia [11] than the outbreaks at Amarillo, Tex., in March, 1946,[1] and Chicago, Ill., in August, 1946.[10]

Results of a survey in slaughter-house workers at San Antonio suggested that the December outbreak of Q fever perhaps was not unique but merely was the most recent. In another slaughter-house two cases had occurred in November, 1947. It seemed probable that Q fever had been occurring for quite some time, as was found at Fort Worth, Tex.[8] Many of those having antibodies for Q fever lacked a history of illness particularly suggestive of Q fever and it seemed likely that several had undergone mild or inapparent attacks. Many of these butchers have followed this occupation for years and perhaps had Q fever antibodies in past years which in some instances had become negative.[5] The percentage of sera showing antibodies was significantly greater in slaughter-house workers than in food handlers at San Antonio.

The list of cases of Q fever shown in Table 1 is undoubtedly only a very small fraction of the total number of cases which have occurred in southwest Texas. Most of these persons were patients of a few physicians who were especially curious, or the diagnosis was made more or less accidentally. Undoubtedly physicians will become increasingly aware of the possibility of Q fever and will make increasing use of laboratory facilities to aid in the diagnosis of this disease.

Frequent failure to obtain a history of intimate contact with livestock was somewhat confusing, however, many persons perhaps would not recall occasional intimate contacts with livestock. It seems probable that case 8 had acquired the infection through working with goats or sheep rather than cattle. The finding of *C. burnetii* in raw milk confirms the report of Huebner and others,[12] in California, and certainly suggests the possibility of infection through ingestion of contaminated milk. The possibility of survival of *C. burnetii* in improperly pasteurized milk has not as yet been investigated.

SUMMARY

1. Six cases of Q fever which occurred among butchers in two slaughter-houses at San Antonio, Tex., in November-December, 1947, were found as a result of a survey.

2. Approximately 5 per cent of slaughter-house workers' sera at San Antonio, Tex., showed complement-fixing antibodies for Q fever. Approximately 1.6 per cent of food handlers' sera at San Antonio showed complement-fixing antibodies.

3. Six cases of Q fever were found in widely scattered communities in southwest Texas.

4. *C. burnetii* was identified in raw milk samples from two dairies in southwest Texas, but the significance of this finding was not determined.

5. Complement-fixing antibodies were found in sera from sheep and goats on a ranch where a case of Q fever occurred.

REFERENCES

1. Topping, Norman H., Shepard, C. C., and Irons, J. V. Q Fever in the United States. I. Epidemiologic Studies of an Outbreak Among Stock Handlers and Slaughter-house Workers. *J.A.M.A.*, 133:813–815 (Mar.), 1947.

2. Irons, J. V., and Hooper, John M. Q Fever in the United States. II. Clinical Data on an Outbreak Among Stock Handlers and Slaughter-house Workers. *J.A.M.A.*, 133:815–818 (Mar.), 1947.

3. Irons, J. V., Murphy, Joseph N., Jr., and Wolfe, Don M. Q Fever in the United States. III. Serologic Observations in an Outbreak Among Stock Handlers and Slaughter-house Workers. *J.A.M.A.*, 133:819–820 (Mar.), 1947.

4. Cox, Herald R., Tesar, Walter C., and Irons, J. V.

Q Fever in the United States. IV. Isolation and Identification of Rickettsiae in an Outbreak Among Stock Handlers and Slaughter-house Workers. *J.A.M.A.*, 133:820–821 (Mar.), 1947.

5. Shepard, C. C., and Huebner, R. J. Q Fever in Los Angeles County: Description of Some of Its Epidemiological Features. *A.J.P.H.*, 38:781–788 (June), 1948.

6. Parker, R. R., and Kohls, G. M. American Q Fever: Occurrence of *Rickettsia diaporica in Amblyomma americanum* in Eastern Texas. *Pub. Health Rep.*, 58:1510–1511 (Oct.), 1943.

7. Communication from Dr. R. R. Parker, Hamilton, Mont.

8. Strauss, E., and Sulkin, S. E. Studies on Q Fever: Complement-fixing Antibodies in Meat Packers at Fort Worth, Texas. *Proc. Soc. Exper. Biol. & Med.*, 67:139–141 (Feb.), 1948.

9. Robbins, F. C., Gauld, R. L., and Warner, F. B. Q Fever in the Mediterranean Area: Report of Its Occurrence in Allied Troops. II. Epidemiology. *Am. J. Hyg.*, 44:23–43 (June), 1946.

10. Shepard, Charles C. An Outbreak of Q Fever in a Chicago Packing House. *Am. J. Hyg.*, 46:185–192 (Sept.), 1947.

11. Derrick, E. H. The Epidemiology of Q Fever. *Brit. J. Hyg.*, 43:357–361 (Apr.), 1944.

12. Huebner, R. J., Jellison, W. L., Beck, M. D., Parker, R. R., and Shepard, C. C. Q Fever Studies in Southern California. I. Recovery of *Rickettsia burnetii* from Raw Milk. *Pub. Health Rep.*, 63:214–222 (Feb.), 1948.

Frontal Attack on Cerebral Palsy

The first national conference on cerebral palsy was held in New York January 6–11. Attended by 1,500 persons, it explored the medical and social aspects of the ailment and laid the groundwork for a national program similar to those for tuberculosis, infantile paralysis, heart disease, and cancer. Among the facts brought out by the conference are that there are about half a million victims of the crippling disease in the country, and that 75 per cent of them can be rehabilitated and taught to gain the use of their muscles.

The preliminary framework for a National Foundation for Cerebral Palsy has been established through Leonard Goldenson, Vice-President of Paramount Pictures and father of a five year old sufferer from cerebral palsy. Three of the other founders, including Albert Felmet, Jr., President of the New York State Cerebral Palsy Association, are parents of cerebral palsied children.

The program for which the foundation plans to work includes federal aid for adequate special educational training for the handicapped; Congressional appropriations for improved local public health services; expansion of state school health activities and crippled children's services; formation of a national research center to work on causes and management of cerebral palsy; federal, state, and local aid for professional training to combat the affliction; and the expansion of citizen associations in the field.

The foundation has temporary offices in the New York Academy of Medicine Building, 2 East 103rd St., New York City. Arthur Larschan, first Vice-President of the New York Group, is serving as its temporary chairman.

Q Fever

Complement-Fixing Antibodies with *C. burnetii* Antigens in Various Geographic Areas and Occupational Groups in the United States *†

ELIAS STRAUSS, M.D., AND S. EDWARD SULKIN, PH.D., F.A.P.H.A.

Department of Bacteriology and Immunology and the Department of Medicine, Southwestern Medical College, Dallas, Tex.

Q FEVER is world-wide in its distribution. Within a decade since its recognition in Australia [1] the disease has been identified in the United States, the Mediterranean area,[2] Switzerland,[3] Germany,[4] and Panama.[5] Although a few sporadic cases had been recognized previously,[6, 7] the first epidemic occurring under natural conditions in this country was reported from Amarillo, Tex., in March, 1946, and involved persons employed in a stockyard and meat packing plant.[8] In August, 1946, a second natural epidemic, also involving packinghouse workers, occurred in Chicago.[9] In the fall of the same year an endemic focus of Q fever was discovered in Los Angeles County, and in the course of the subsequent year approximately 150 cases were identified.[10, 11]

The mode of transmission of Q fever to human beings has not been defined satisfactorily nor has its natural reservoir or vector been clearly identified. In Australia [12] and in the United States [13, 14] ticks infected with *Coxiella burnetii* have been found in nature and in sporadic instances have been responsible for the human disease.[7, 15] Investigations of the epidemics in this country and in the Mediterranean area, however, have not incriminated ticks or other arthropods as the vectors of Q fever. Two of the 3 American epidemics have involved packinghouse and stockyard workers but the manner in which infection took place was not established. In the Los Angeles County outbreak the investigators pointed to a relationship with dairy cows, and indeed milk from such animals was found to be infected with *C. burnetii*.[10] However, it was not established that infection took place through the ingestion of milk. At present, no single explanation seems adequate to satisfy the varying circumstances under which the disease has been recognized.

A complement-fixation test has been devised for the detection of antibodies against a *C. burnetii* antigen prepared from the infected yolk sacs of embryonated hen's eggs.[16] Such antibodies have been found to persist in sera following naturally acquired infections for as long as 17 months.[17]

In view of these facts, it appeared desirable to undertake a serological survey to determine the frequency with which antibodies against a *C. burnetii* antigen occurred in different geographic areas and among different occupational groups. Sera from packinghouse workers and dairy workers were selected because of the previous occurrence of Q

---

* Presented at a Joint Session of the Epidemiology and Laboratory Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 12, 1948.

† This study was aided by grants from the Lederle Laboratories Division of the American Cyanamid Company, Pearl River, N. Y., and the Rose Lampert Graff Foundation, Los Angeles, Calif.

fever among such workers. In addition, samples of sera from the general population in widely separated areas of the country were secured. A preliminary report of the occurrence of antibodies against *C. burnetii* in packinghouse workers in Fort Worth, Tex., has already been presented.[18] In this report the results of complement-fixation tests on 5,470 sera are summarized as follows: packinghouse workers at Fort Worth, 1,433 sera; packinghouse workers at Austin, Minn., 150 sera; routine serological laboratory specimens from Amarillo, Tex., 175 sera; routine serological laboratory specimens from Dallas, Tex., 1,033 sera; routine serological laboratory specimens from Boston, Mass., 965 sera; routine specimens from prospective blood donors from Dallas, 798 sera; specimens from dairy workers in the Dallas milk shed, 350 sera; and, finally, routine serological laboratory specimens from Portland, Ore., 566 sera (the latter collected and tested for antibodies by Dr. A. W. Frisch and the results included in this report with his kind permission). The results have been analyzed with regard to the specificity of the serologic tests employed, and for the information they yield with regard to the frequency of occurrence of antibodies for *C. burnetii* in the United States.

METHODS

Serum specimens were transported to this laboratory within 2 days after collection if obtained locally, or by air express from distant points, and were stored in a deep freeze cabinet until tested.

The Q fever antigen was prepared from the yolk sacs of embryonated eggs infected with a strain of *C. burnetii* (American Nine Mile) isolated in Montana in 1935.[23] The antigen was a washed rickettsial suspension prepared by a combination of ether extraction to remove fats and repeated centrifugation cycles to remove extraneous proteins and fats.[19] Two lots of antigens were used (Q9M-5-16 and Q9M-4-26). Almost all sera reacting with *C. burnetii* antigens were also tested with a yolk sac antigen prepared from uninfected embryonated eggs.*

Complement-fixation tests were performed according to the method of Bengtson.[16] The antigen was diluted 1:32 (2 units). Complement was titrated in the presence of antigen, and 2 units of complement were used in the tests.

Serial twofold dilutions of inactivated sera were made, using a single pipette for each serum specimen. The hemolytic system consisted of equal volumes of 2 per cent sheep erythrocytes and amboceptor made up to 2 units. In performing the tests, 0.2 ml. of diluted antigen, serum, and complement were added to each tube, mixed thoroughly, and stored at icebox temperature for 18 hours. Sensitized sheep erythrocytes (0.4 ml.) were then added, and the tubes held at 37° C. in a water bath for 1 hour or until control tubes showed complete hemolysis. Appropriate serum and antigen controls, as well as known positive and negative human and guinea pig sera, were included in each series of tests. The endpoint was read as the highest serum dilution showing at least 3+ fixation.

All sera were examined in a "screen" test using 2 dilutions of serum: 1:8 and 1:16. Sera having titers of 1:16 in the "screen" test were retested in twofold serial dilutions from 1:8 to 1:512 or greater.

Serological Tests for Syphilis—A variety of serological tests for syphilis were performed. Approximately 40 per cent of the sera were tested in one Dallas laboratory (Parkland Hospital) by routine Kahn and Kline tests, Kolmer type

* The *C. burnetii* and normal yolk-sac antigens were prepared in the laboratories of Dr. Herald R. Cox, Lederle Laboratories Division, American Cyanamid Company; generous supplies were made available by Dr. Cox.

TABLE 1

Complement-Fixation Titers against C. burnetii and Results of Serological Tests for Syphilis among 5,470 Sera from Various Geographic Areas and Occupational Groups in the United States

Series	Date of Collection	Results of STS				Results of C-F Tests against C. burnetii								
		No. + or ±	No. Neg.	No. Unknown	Per cent + or ±	No. Sera Tested	No. Positive C. burnetii and + or ± STS	Serum Titers *						Per cent Positive 8 or >
								AC	< 8	8	16	32	64 or >	
Fort Worth meat packers	May-June 1947	58	1,375	0	4.0	1,433	6	81	1,238	34	48	15	17	8.0
Minnesota meat packers	Nov. 1947 Jan. 1948	1	142	7	0.7	150	0	5	144	1	0	0	0	0.7
Amarillo serology lab.	Aug. 1947	10	165	0	5.7	175	2	19	142	6	6	0	2	7.9
Dallas serology lab.	July 1947	397	636	0	38.4	1,033	63	78	850	39	55	7	4	10.2
Boston serology lab.	Oct.-Nov. 1947	102	963	3	9.6	965	1	45	909	1	8	1	1	1.1
Dallas blood donors	Dec. 1947 Mar. 1948	24	774	0	3.0	798	1	10	771	9	8	0	0	2.1
Dallas dairy workers	Mar.-Apr. 1948	4	311	35	1.1	350	1	6	337	3	2	2	0	2.0
Portland, Ore. serology lab.	1948	1	470	95	0.2	566	0	2	554	6	4	0	0	1.8

+ = positive STS
± = doubtful STS
AC = anticomplementary serum
* = highest serum dilution yielding 3+ or greater fixation

complement-fixation tests, and by the use of cardiolipin antigens. Another 20 per cent were tested by similar techniques, including the use of cardiolipin antigens in the laboratory of the Fort Worth Health Department. The sera from Boston were tested by the Hinton test in the laboratory of Dr. William A. Hinton. The remainder were tested by the Amarillo Health Department and by Dr. A. W. Frisch by the usual Kline and Kahn techniques.

RESULTS

The results of the studies are presented in 2 parts: first a description of the origin and composition of the various groups from which serum specimens were obtained and the antibody titers found; and second, data bearing on the specificity of the test.

Fort Worth: packinghouse workers—Serum specimens obtained from 1,433 persons employed in the actual handling and processing of meat and meat products in one large and several small packinghouses at Fort Worth, Tex., were tested for complement-fixing antibodies against *C. burnetii* antigen. A preliminary report of this study has been published.[18] The data will be summarized here for comparison with the results of other studies. The specimens were collected during May and June, 1947, by the Fort Worth Health Department for the performance of routine serological tests for syphilis required of food handlers. The majority of persons tested were adult white males but complete data on age, sex, and racial composition of the total group were not available.

Among the entire group of 1,433 sera, 8 per cent exhibited complement-fixing antibodies in a titer of 8 or more. The titers are recorded in Table 1. Seventeen serum specimens (1.2 per cent) had titers of 64 or more; among these, 10 had a titer of 64, 2 a titer of 128, 3 a titer of 256, and 2 a titer of 512.

It was not possible to interview the individuals with high titers of antibodies against *C. burnetii* or to obtain information with regard to illness. The plant physicians were unaware of the occurrence of an epidemic or of an unusual number of cases of unexplained illness. Analyses of the specific work performed by those with elevated antibody titers did not suggest a correlation with any particular job or department in the plants.

Minnesota: packinghouse workers—From November, 1947, to January, 1948, 150 serum specimens were received from a large meat packing plant in Austin, Minn. The sera were obtained from employees who came to the plant dispensary for first aid and for various medical complaints. Specimens were collected only from those employees who actually handled meat and meat products within the plant. All but 6 were white males between 20 and 61 years of age. One-third of the group had been employed at the plant for more than 15 years each, and 90 per cent of the group had been employed there for more than 5 years. In contrast with the results among packinghouse workers in Fort Worth, only one serum (0.7 per cent) in the Minnesota series exhibited complement-fixing antibodies with *C. burnetii* antigen, and then only in a titer of 8 (Table 1).

Amarillo: Serological laboratory—In August, 1947, 175 serum specimens were obtained from the Amarillo (Texas) City Health Department after routine serological tests for syphilis had been performed. Most of the sera were obtained from adult white males but the specific age, sex, and racial composition of the group was not available.

Fourteen sera (7.9 per cent) exhibited titers of 8 or more (Table 1). Both of the individuals with high titers (64 and 1,024) were subsequently found to have been ill with Q fever during the stockyard epidemic of March, 1946.[8] Histories of illness were not available from

the other 12 individuals with titers of 8 or more.

Dallas: serological laboratory—During July, 1947, 1,033 consecutive serum specimens were obtained from the serological laboratory at Parkland Hospital, Dallas. All sera were originally submitted for serological tests for syphilis. Approximately 60 per cent of the sera were obtained from the venereal disease clinic and the remainder from inpatients, prospective blood donors, and patients attending other clinics at the hospital. Almost all persons were adults, 43 per cent were male, 57 per cent female, 33 per cent were white, and 67 per cent were Negroes.

One hundred and five sera (10.2 per cent) were found to have complement-fixing antibody titers of 8 or more against *C. burnetii* (Table 1). However, only 11 sera had titers of 32 or more and only 4 had titers of 64; none had titers in excess of 64. The sex and racial distribution of those with titers of 8 or more was the same as for the series as a whole. The clinic or hospital records of these patients were reviewed. Several gave a history of pneumonia. No clear evidence of an illness which might have been Q fever was obtained, but the records were considered inadequate for the purpose.

Boston: serological laboratory—During October and November, 1947, 965 sera were received from the Wassermann Laboratory of the Massachusetts State Department of Health and were tested for complement-fixing antibodies against *C. burnetii*. These blood samples had been submitted from various sources for routine serological tests for syphilis. Almost all were from adults, 64 per cent were from females, and 98 per cent were from white persons.

Eleven of the 965 sera (1.1 per cent) contained antibodies for *C. burnetii* in a titer of 8 or more; the titer was 8 in one instance, 16 in 8, 32 in 1, and 64 in 1 (Table 1). The sex and racial distribution of these 11 persons conformed to the distribution in the series as a whole. A questionnaire inquiring into occupation, history of "virus" pneumonia, and service in the Mediterranean area during World War II was answered by 7 of the 11 positive reactors. One whose serum had a titer of 32 had "virus" pneumonia in 1943; another with a serum titer of 16 had pneumonia in the winter of 1947. The individual whose serum showed a titer of 64 denied any illness in the past 2 years.

Dallas: blood donors—Because of the high incidence of positive reactors with both *C. burnetii* and syphilitic antigens in the first Dallas series, another series of different composition was obtained. From December, 1947, to March, 1948, consecutive samples of blood were obtained from prospective blood donors, the samples being submitted for routine serological tests for syphilis. (The latter were performed in the same laboratory as the first Dallas series.) A total of 798 blood samples were obtained. Two-thirds of the donors were white, and one-third colored; 80 per cent were males and 20 per cent females.

Seventeen (2.1 per cent) of this group had complement-fixing antibodies; 9 had a titer of 8, and 8 a titer of 16 (Table 1). The racial and sex distribution for these persons was the same as for the whole group. A history of occupation or of illness was not available.

Dallas: dairy workers—A total of 350 blood samples was obtained during March and April, 1948, from dairy and dairy plant workers in the Dallas area. One hundred and one of these actually lived and worked on dairy farms in close association with dairy cows. All but one were white adults, from 16 to 69 years of age; 87 were males and 14 females. All but 14 per cent had been so employed for more than 1 year; 60 per cent for more than 5 years; and 40

per cent for more than 10 years. In this group, only one individual's serum fixed complement with *C. burnetii* antigen in a dilution of 8 or more; in this person, the titer was 32.

In addition to the farm workers, 249 blood samples were secured from employees of dairy plants, the majority of whom were white males. Approximately two-thirds of the total were indoor plant workers engaged in various phases of the pasteurization and packaging of milk and milk products; the remainder were mostly route salesmen. Of this group of 249, 6 (2.4 per cent) reacted positively with *C. burnetii* antigen. Three had a serum titer of 8, 2 a titer of 16, and one a titer of 32. Combining both groups of dairy workers, 7 of 350 (2.0 per cent) reacted positively; the highest titer being 32 in 2 persons (Table 1).

Oregon: serological laboratory — Through the courtesy of Dr. A. W. Frisch it was possible to include the results on 566 specimens submitted to several serological laboratories in Portland, Ore., for routine serological tests for syphilis. Dr. Frisch's technique in testing for antibodies to *C. burnetii* was similar to that used here with 2 exceptions: (1) the serum dilutions were 10, 20, etc., instead of 8, 16, etc., and (2) the Henzerling instead of American (Dyer) strain of *C. burnetii* was used as antigen. The results are recorded in Table 1. Ten of 566 samples (1.8 per cent) reacted positively in a titer of 10 or more. Six had a titer of 10, and 4 a titer of 20. These results are recorded in Table 1, under the columns for titers of 8 and 16 respectively.

SPECIFICITY OF THE SEROLOGICAL TEST

Relation between STS and serum reactivity with C. burnetii—The unexpectedly high (10.2 per cent) frequency of serum reactors to *C. burnetii* antigen among the 1,033 specimens in the original Dallas series prompted further analysis of the data. The results clearly revealed a significant correlation between a positive or doubtful STS and reactivity in the complement-fixation test with *C. burnetii*.

Of the 1,033 sera tested, 38.4 per cent yielded positive (27.1 per cent) or doubtful (11.3 per cent) tests for syphilis. However, in the group of 105 sera yielding positive complement-fixation tests with *C. burnetii* antigen, 60 per cent also had positive or doubtful tests for syphilis. This relationship, expressed according to the titers of rickettsial antibodies, is shown in Table 2. The whole series was then divided into 2 groups according to whether the STS was negative (636 sera) or positive or doubtful (397 sera), and the number and percentage of reactors with the rickettsial antigen calculated (Tables 3 and 4). A fourfold table relating positive and negative reactivity with *C.*

TABLE 2

Dallas Serological Laboratory Series
Number and Per cent of Sera with Positive or Doubtful STS among 105 Positive Reactors with C. burnetii

Serum Titer for C. burnetii	Number of Sera	Positive or Doubtful STS	
		Number	Per cent
8	39	19	48.7
16	55	37	67.3
32	7	4	57.1
64	4	3	75.0
Total	105	63	60.0

TABLE 3

Dallas Serological Laboratory Series
Complement-Fixation Titers against C. burnetii among 636 Sera with Negative STS

Titer	No. of Sera	Per cent	Total Per cent Positive
AC	38	6.0	
<8	556	87.4	
8	20	3.1	
16	18	2.8	6.6
32	3	0.5	
64	1	0.2	
Total	636	100.0	

TABLE 4

Dallas Serological Laboratory Series Complement-Fixation Titers against C. burnetii among 397 Sera with Positive or Doubtful STS

Titer	No. of Sera	Per cent	Total Per cent Positive
AC	40	10.1	
<8	294	74.1	
8	19	4.8	
16	37	9.3	15.9
32	4	1.0	
64	3	0.8	
Total	397	100.1	

burnetii with the results of the tests for syphilis, in the whole series, yielded a chi square value of 23 and the highly significant P value of less than 0.01.

In the Fort Worth series 4.0 per cent had positive or doubtful STS; among the 114 sera in this series which reacted positively with *C. burnetii,* 6 (5.4 per cent) also had positive or doubtful STS. The rickettsial complement-fixation titers among these 6 individuals with positive or doubtful STS were: 8 in 2 instances, 16 in 3, and 512 in 1. The relationship between the 2 serologic tests could be fortuitous and the P value was not statistically significant.

In the Amarillo series, 5.7 per cent of the sera yielded positive or doubtful results in the STS. Among the 14 sera which fixed complement in the presence of the rickettsial antigen, 2 (14.3 per cent) also had positive STS. The titers for *C. burnetii* in both of these sera were 16. The series is too small for statistical analysis although the results suggest more than a coincidental relationship between the two serologic tests.

Among the 101 specimens from dairy farmers in the Dallas milk shed, the only serum which reacted positively with *C. burnetii* (titer 32) also yielded a doubtful reaction in the serologic tests for syphilis. In all of the other series studied, the relationship between reactivity with syphilitic antigens and the rickettsial antigen could be explained by chance association. Likewise, statistical analysis of all series combined (excluding the original Dallas series) yielded a P value which was not significant.

Reactions with normal yolk-sac antigen—The possibility was considered that some of the sera which reacted in the presence of *C. burnetii* yolk-sac antigen might also fix complement in the presence of normal, uninfected yolk sacs. Accordingly an antigen was obtained from Dr. Herald R. Cox consisting of the yolk sacs of normal embryonated hen's eggs prepared by the same technique as the rickettsial yolk-sac antigens. Almost all sera which reacted in a titer of 8 or more with rickettsial antigen in the "screen" test were again tested with normal yolk-sac antigen and with *C. burnetii* antigen. In no instance was a positive reaction encountered with normal yolk-sac antigen.

Effect of temperature of inactivation—In further attempts to determine the specificity, or lack of specificity, of serological reactions with *C. burnetii,* a number of tests were performed at various temperatures of inactivation of the sera. Inactivation was carried out at 56° C. for 10 minutes and at 65° C. for 15 minutes on sera which in the usual tests reacted with both syphilitic and rickettsial antigens. There were no significant differences in the rickettsial complement-fixation titers at different temperatures of inactivation, nor was complement-fixation demonstrated with the normal yolk-sac antigen under these circumstances.

Reproducibility of results—Sera reacting positively with *C. burnetii* antigen were retested at least once and in many instances several times. Titers tended to fall off, and the sera to become anti-complementary, with repeated thawing and freezing incidental to storage and retesting. The results of repeated tests, however, conformed to the usual reproducibility of most quan-

titative complement-fixation tests. Unusually discrepant results were not encountered. Two different lots of antigen were employed and many of the positive sera were tested with both antigens, with similar results. A group of positive and negative sera were also tested in the laboratory of Dr. Cox with results corresponding well with those obtained in this laboratory.

Persistence of antibodies — Complement-fixing antibodies persist for many months following proved natural infection with Q fever.[17] It was, therefore, of interest to determine the antibody titers on serum specimens obtained several months after the original samples. Nonspecific reactivity might be expected to fluctuate or disappear while true antibody might be expected to persist or decline in titer slowly. Second blood samples were obtained in 42 instances from Fort Worth meat packers 4 months after the original bleedings; in all cases a titer of 8 or more was demonstrated. A comparison of the titers of original and second specimens is shown in Table 5. A distinction is made between a titer of 0, indicating a complete absence of complement-fixation in a final serum dilution of 8, and a titer of <8, indicating some fixation of complement but less than a 3+ reading. With a few exceptions the titers declined in the 4 months interval. However, the falls in titer were moderate and uniform at all initial levels. Of 42 persons, with titers of 8 or more, 23 still had titers of 8 or more 4 months later.

In the series from the Boston laboratory, second samples of blood were obtained from 3 individuals, 1 month, 2 months, and 6 months after the original specimens. Two with original titers of 16 still had titers of 16, 2 and 6 months later; while a third with an original titer of 64 had a titer of 32, 1 month later. One of the positive sera was originally also positive in the serologic test for syphilis. The second specimen from this subject, while exhibiting the same titer with *C. burnetii* antigen, was negative in the test for syphilis.

Hospital patients with suspected Q fever and miscellaneous diseases—Acute and convalescent phase (3–4 weeks after onset) blood specimens were obtained from 22 patients suspected of having Q fever. Seven patients had pulmonary infiltrations without evidence of bacterial pneumonia. The remainder were sporadic cases of acute febrile illnesses in which the usual studies did not establish a specific diagnosis. In addition, acute and convalescent blood was obtained from 2 cases of infectious mononucleosis. Single blood samples were also obtained from 22 cases of lymphopathia venereum. Complement-fixation tests with *C. burnetii* antigen were negative in all instances, with one exception:

A 20 year old male white college student with previous Army service in Korea was hospitalized with fever and pulmonary infiltration. Malaria was proved by examination of blood smears. On appropriate antimalarial chemotherapy, fever and the pulmonary lesion disap-

TABLE 5

Complement-Fixing Antibodies against C. burnetii in Fort Worth Meat Packers
Comparison of Titers in May, 1947, and September, 1947

Titers in September, 1947	*Titers in May, 1947*							
	8	*16*	*32*	*64*	*128*	*256*	*512*	*Total*
0	1	3	..	..	..	..	..	4
<8	7	6	1	1	..	..	..	15
8	..	1	..	1	..	..	..	2
16	1	3	2	2	..	..	..	8
32	..	3	1	2	..	..	..	6
64	..	..	..	2	1	1	1	5
128	..	..	..	..	..	1	1	2
Total	9	16	4	8	1	2	2	42

peared within a week. Blood serum taken 5 days after onset was anticomplementary; the STS at this time was negative. Blood serum taken 12 days after onset fixed complement with *C. burnetii* in a titer of 16, but another sample taken 6 weeks after onset had a titer of less than 8. It is difficult to evaluate the significance of these serological reactions. The relatively low titer and its rapid fall suggested a nonspecific reaction, possibly related to malaria.

In the original Dallas series were included the results of complement-fixation tests on sera of 129 hospitalized patients. The single blood samples available were obtained, in general, within a few days after admission to the hospital. These patients, representing consecutive admissions to all services of a general hospital, suffered from a wide variety of illnesses. Approximately one-third had acute or chronic infections and many were febrile at the time blood was drawn. No evident correlation was found between the diagnosis established during hospitalization and the complement-fixation titer against *C. burnetii*, with the exception, already mentioned in this series, of the association between positive STS and reactivity with the rickettsial antigen.

DISCUSSION

A considerable body of evidence attests the diagnostic significance of a rising titer of complement-fixing antibodies for *C. burnetii* following an illness. Such antibody responses have been demonstrated following illness proved to be Q fever by recovery of the rickettsiae from the bloodstream.[2, 8] It is also established that such antibodies persist for prolonged periods of time.[16, 17]

On the other hand, there are few data by which can be assessed the specificity and diagnostic significance of complement-fixation with *C. burnetii* antigen of single serum specimens obtained without knowledge of the clinical history, from presumably well persons. To our knowledge, no large serological surveys employing this test have been recorded. Cross-reactions with other rickettsial antibodies do not occur in Q fever,[16] but systematic studies of possible nonspecific reactions or cross-reactions with other diseases have not come to our attention. Moreover, the data are not available which would permit one to regard any particular serum titer as being significant of a previous attack of Q fever.

In the original Dallas series the incidence of complement-fixing antibodies to *C. burnetii* was 15.9 per cent among persons with positive or doubtful serologic tests for syphilis and 6.6 per cent among those with negative tests for syphilis. Since this difference was not likely to arise by chance, some other explanation must be sought. Possibilities to be considered include: (1) false positive serologic tests for syphilis occurred in the presence of antibodies for *C. burnetii;* (2) some factor of selection in the series, such that *C. burnetii* antibodies were more common in persons who also had syphilis; and (3) nonspecific complement-fixation occurring with *C. burnetii* yolk-sac antigen in the presence of syphilis.

The occurrence of false positive serologic tests for syphilis in persons with complement-fixing antibodies for *C. burnetii* seems unlikely. Three-fourths of the 105 persons with rickettsial antibodies were attending a venereal disease clinic. In almost all instances the diagnosis of syphilis was well established. Most patients had been seen originally with primary or secondary syphilis; several had neurosyphilis; and in 9 instances Kahn titers of 64 or more units were present at the time of this study. Available evidence indicates, therefore, that most of these subjects had syphilis and not false positive serologic tests for syphilis.

That the observed relationship between serologic tests for syphilis and

complement-fixation with *C. burnetii* was due to some factor of selection in the group studied, cannot be supported or denied with assurance. The race and sex distribution of the *C. burnetii* reactors was the same as for the group as a whole. Most of them were urban dwellers. The females worked most often as domestics, the males as unskilled laborers. Considering the clientele of the clinic it seems reasonable to believe that positive and negative reactors to *C. burnetii* antigen as well as those who had positive or negative serologic tests for syphilis all came from the same general environment and engaged in the same occupations. Specific data to substantiate these assumptions are not available.

The possibility of nonspecific complement-fixation with *C. burnetii* antigen in sera with positive or doubtful serologic tests for syphilis should receive serious consideration. Previous studies have indicated that other yolk-sac antigens may also fix complement with syphilitic sera.[20, 21] The present results cannot be explained satisfactorily, but they raise a question with regard to the specificity of this test which can only be settled by further investigation.

If it is assumed that the presence of complement-fixing antibodies for *C. burnetii* indicates previous infection with this organism one must conclude that this survey disclosed a considerable number of otherwise unrecognized cases of Q fever. This assumption seems particularly strong in connection with the results obtained in the packinghouse workers at Fort Worth. Not only was the total incidence of positive serological reactions high (8 per cent), but the incidence of high titers was also considerable (2.3 per cent had titers of 32 or more). The persistence of the antibodies for a period of 4 months further supports the belief that they indeed represented infections with Q fever. The fact that an epidemic was not recognized may be explained on the assumption that the illnesses were sporadic, that they masqueraded under more banal clinical labels, or that they were subclinical. All of these possibilities are known to occur with Q fever.

The serological results obtained among meat packers at Fort Worth thus represent the third instance in this country in which Q fever has been identified in packinghouse workers. However, as Shepard had already pointed out, the infectious agent must reside rarely, not commonly, in such an environment.[9] Among the Minnesota packinghouse workers the incidence of positive reactors for *C. burnetii* was negligible, and yet these workers had had contact with many thousands of animals over the course of years.

Unlike recent experiences in Los Angeles County, the incidence of rickettsial antibodies among dairy workers in the Dallas area was not higher than in a sample of the general population. Many of the persons studied had had years of close association with dairy cattle. As with meat packers, one must conclude that the epidemiological association between Q fever and occupation or environment seems to be an intermittent, and not a constantly operating phenomenon.

In one of the studies of the Los Angeles outbreak recently reported, data are presented indicating that 1.8 per cent of a group of sera with negative STS from individuals residing in the milk shed area exhibited complement-fixing rickettsial antibodies in a titer of 8 or 16.[11] In the present study, a similar incidence of antibodies in low titer was also found in Dallas, Boston, and Oregon, areas where Q fever has not been recognized clinically. In Texas (Dallas, Amarillo, and Fort Worth) the incidence of antibodies for *C. burnetii* appears to be higher than elsewhere. These data may suggest that Q fever

may be widely distributed throughout the United States.

A question has arisen in recent publications as to the selection of the proper strain of *C. burnetii* for use as an antigen in complement-fixation tests. Patients infected in Italy with Q fever developed complement-fixing antibodies to the Italian (Henzerling) strain but not to the American (Dyer) strain.[2] The latter has been said to be a less sensitive antigen than the former.[22] Immunized guinea pigs developed an early rise in titer to the Henzerling strain, and a delayed response to the Dyer strain, but 2 months later the titers became comparable. Similarly, human beings immunized with vaccines prepared with these strains exhibited better antibody responses with the Henzerling than with the Dyer strains.[23] It must be pointed out however, that successful, and diagnostically useful, complement-fixation tests were performed with the Dyer strain in the investigation of the Amarillo epidemic,[8] and in a follow-up study of this epidemic, carried out at this laboratory, dealing with the persistence of antibodies.[17] The problem of the choice of antigens cannot be considered settled. The present study was conducted entirely with the use of the Dyer strain and no comparisons with the 2 antigens could be made. If the results of the studies mentioned above are applicable to the present circumstances it may be implied that an even greater number of sera would have fixed complement had the Henzerling strain been employed.

SUMMARY

1. Complement-fixation tests were performed in 5,470 sera using yolk-sac antigen of *C. burnetii* (American Nine Mile strain). The sera were obtained from persons residing in Massachusetts, Minnesota, Oregon, and Texas. Sera were obtained from meat packers in Fort Worth, Tex., and Austin, Minn., and from dairy workers in the Dallas area.

2. Sporadic instances of complement-fixation, which may indicate Q fever, were found in sera from all geographic areas included in the study, suggesting that Q fever may occur in low incidence throughout the country. Evidence for its occurrence in appreciable numbers among packinghouse workers in Fort Worth was presented. The evidence also suggested that residents of the southwestern part of the United States may have a higher incidence of complement-fixing antibodies with *C. burnetii* than in other areas of the country.

ACKNOWLEDGMENTS—The serological studies in this laboratory were performed by Elizabeth L. Watson and Helen Leonard. Grateful acknowledgment is made to: Drs. Harold M. Williams and D. A. Reekie for supplying serum specimens from Fort Worth, and to Miss Edith Mazurek for performing STS on these specimens; Dr. William A. Hinton for supplying the serum specimens from Boston, performing STS on these sera, and for supplying clinical data and second specimens on positive cases; Dr. H. R. Allen, for supplying sera from Austin, Minn.; Jack Wyatt for sera from Amarillo and STS on these sera; Dorothy Lee for supplying sera from Dallas and for STS on these and other sera; Earl Sudderth and his staff for assistance in collecting sera from Dallas dairy workers; and Dr. A. W. Frisch of Portland, Ore., for generously permitting the inclusion in this report of data obtained in his laboratory.

We also wish to acknowledge the generous assistance of Dr. Herald R. Cox in supplying the antigens used in this study and in testing selected sera in his laboratory.

REFERENCES

1. Derrick, E. H. "Q" Fever, a New Fever Entity: Clinical Features, Diagnosis and Laboratory Investigation. *M. J. Australia*, 2:281–299 (Aug. 21), 1937.

2. Robbins, F. C., Rustigian, R., Snyder, M. J., and Smadel, J. E. Q Fever in the Mediterranean Area: Report of Its Occurrence in Allied Troops. III. The Etiological Agent. *Am. J. Hyg.*, 44:51–63 (July), 1946.

3. Gsell, O. Q Fever (Queensland Fever) in Switzerland: Endemic Pneumonias Caused by *Rickettsia burnetii*. *Schweiz. med. Wchnschr.*, 78:1–24 (Jan. 10), 1948.

4. Schulze, H. A., and Gauld, R. L. A Probable Outbreak of Q Fever in Munich, Germany. *M. Bull., European Theat.*, 4:20–23, 1947.

5. Cheney, G., and Geib, W. A. Identification of Q Fever in Panama. *Am. J. Hyg.*, 44:158–172 (July), 1946.

6. Cox, H. R. *Rickettsia diaporica* and American Q Fever. *Am. J. Trop. Med.*, 20:463–469, 1940.

7. Hesdorffer, M. B., and Duffalo, J. A. American Q Fever. Report of a Probable Case. *J.A.M.A.*, 116:1901–1902 (Apr. 26), 1941.

8a. Topping, N. H., Shepard, C. C., and Irons, J. V. Q Fever in the United States. I. Epidemiological Studies of an Outbreak Among Stock Handlers and Slaughterhouse Workers. *J.A.M.A.*, 133:813–815 (Mar. 22), 1947.

b. Irons, J. V., and Hooper, J. M. Q Fever in the United States. II. Clinical Data on an Outbreak Among Stockhandlers and Slaughterhouse Workers. *J.A.M.A.*, 133:815–818 (Mar. 22), 1947.

c. Irons, J. V., Murphy, J. N., and Wolfe, D. M. Q Fever in the United States. III. Serologic Observations in an Outbreak Among Stock Handlers and Slaughterhouse Workers. *J.A.M.A.*, 133:819–820 (Mar. 22), 1947.

d. Cox, H. R., Tesar, W. C., and Irons, J. V. Q Fever in the United States. IV. Isolation and Identification of Rickettsias in an Outbreak Among Stock Handlers and Slaughterhouse Workers. *J.A.M.A.*, 133: 820–821 (Mar. 22), 1947.

9. Shepard, C. C. An Outbreak of Q Fever in a Chicago Packinghouse. *Am. J. Hyg.*, 46:185–192 (Sept.), 1947.

10. Huebner, R. J., Jellison, W. L., Beck, M. D., Parker, R. R., and Shepard, C. C. Q Fever Studies in Southern California: I. Recovery of *Rickettsia burnetii* from Raw Milk. *Pub. Health Rep.*, 63:214–222 (Feb. 9), 1948.

11. Shepard, C. C., and Huebner, R. J. Q Fever in Los Angeles County, Description of Some of Its Epidemiological Features. *A.J.P.H.*, 38:781–788 (June), 1948.

12. Smith, D. J. W., and Derrick, E. H. Studies in the Epidemiology of Q Fever. I. Isolation of Six Strains of *Rickettsia burnetii* from the Tick *Haemaphysalis humeross*. *Australian J. Exper. Biol. & M. Sc.*, 18:1–8 (Mar.), 1948.

13. Davis, G. E., Cox, H. R., Parker, R. R., and Dyer, R. E. A Filter-Passing Infectious Agent Isolated from Ticks. I. Isolation from *Dermacentor andersoni*, Reactions in Animals and Filtration Experiments. *Pub. Health Rep.*, 53:2259–2282 (Dec. 30), 1938.

14. Parker, R. R., and Kohls, G. M. American Q Fever: the Occurrence of *Rickettsia diaporica* in *Amblyomma americanum* in Eastern Texas. *Pub. Health Rep.*, 58:1510 (Oct. 8), 1943.

15. Ecklund, Carl M., Parker, R. R., and Lockman, David B. A Case of Q Fever Contracted by Exposure to Ticks in Nature. *Pub. Health Rep.*, 62:1413–1416 (Sept. 26), 1947.

16a. Bengtson, I. A. Complement-Fixation in Q Fever. *Proc. Soc. Exper. Biol. & Med.*, 46:665–668, 1941.

b. Bengtson, I. A. Complement-Fixation in the Rickettsial Diseases—Techniques of the Test. *Pub. Health Rep.*, 59:402–405, 1944.

17. Sulkin, S. E., and Strauss, E. Studies on Q Fever: Persistence of Complement-Fixing Antibodies After Naturally Acquired Infection. *Proc. Soc. Exper. Biol. & Med.*, 67:142–144, 1948.

18. Strauss, E., and Sulkin, S. E. Studies on Q Fever: Complement-Fixing Antibodies in Meat Packers at Fort Worth, Texas. *Proc. Soc. Exper. Biol. & Med.*, 67:139–141, 1948.

19. Cox, H. R. Personal Communication.

20. Wertman, K. Non-Specific Complement-Fixing Antigen in Embryonic Egg Tissues. *J. Lab. & Clin. Med.*, 30:112–118 (Feb.), 1945.

21. van der Scheer, J., Bohnel, E., and Cox, H. R. Diagnostic Antigens for Epidemic Typhus, Murine Typhus and Rocky Mountain Spotted Fever. *J. Immunol.*, 56:365–375 (Aug.), 1947.

22. Topping, N. H., Shepard, C. C., and Huebner, R. J. Q Fever. An Immunological Comparison of Strains. *Am. J. Hyg.*, 44:173–182 (July), 1946.

23. Smadel, J. E., Snyder, M. J., and Robbins, F. C. Vaccination Against Q Fever. *Am. J. Hyg.*, 47:71–81 (Jan.), 1948.

The Epidemiology of Accidents*

JOHN E. GORDON, M.D., F.A.P.H.A.

Professor of Preventive Medicine and Epidemiology, Harvard School of Public Health, Boston, Mass.

EXISTING rates for deaths from accidents and violence remain numerically at almost the identical level of 1900, 88 per 100,000 population in 1900 and 88 in 1946. The relative position among public health problems is at a higher level,[1] since these conditions have advanced as a cause of death in the United States from sixth place in 1900 to third in 1946.

Industry and various governmental agencies have given much attention to the accidents that occur in the places where men work, in public areas, and in relation to motor cars. Accidents in homes outdistance any other class in the losses they cause, whether judged by deaths, by the permanent defects that follow, or by temporary disability. Like all programs for the prevention of mass disease and injury, that directed toward accidents is necessarily a team effort involving a number of agencies and a variety of disciplines. Although health departments have an obligation in all accident prevention, a better record for home accidents is believed to depend largely upon what health departments do in that field. If home accidents are primarily a public health problem, then that problem is reasonably to be approached in the manner and through the technics that have proved useful for other mass disease problems. This includes first an epidemiologic analysis of the particular situation, an establishment of causes, the development of specific preventive measures directed toward those causes, and finally a periodic evaluation of accomplishment from the program instituted.

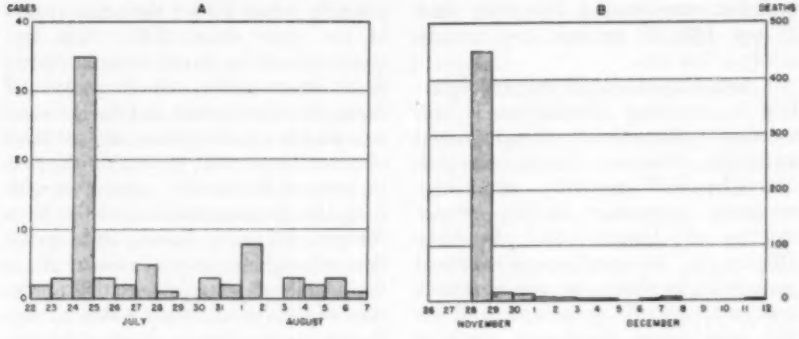
No need exists in these days to trace the way in which the epidemiologic method has extended from its original restriction to the communicable diseases, to a broad application to mass disease of man; to cancer, diabetes, congenital anomalies, and many others. It is not so generally appreciated that injuries, as distinguished from disease, are equally susceptible to this approach, that accidents as a health problem of populations conform to the same biologic laws as do disease processes and regularly evidence a comparable behavior. This is readily indicated by an initial comparison of representative diseases and injuries according to frequency distributions in time, an epidemiologic characteristic of established value in separating one mass disease from another, and in distinguishing kinds of behavior.

MOVEMENTS OF DISEASE AND INJURY ACCORDING TO TIME

The point epidemic is perhaps the most arresting of all distributions in time, that circumstance where a sharp aggregation of cases occurs within a brief interval as the result of a single agent acting during a prescribed and limited time (Figure 1). A circus train[2] backed up to a standpipe in the Pittsburg railroad yards, filled its tanks with untreated river water and some two weeks later typhoid fever exploded

* Presented before a Joint Session of the Public Health Education and Vital Statistics Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., Nov. 12, 1948.

FIGURE 1—Point Epidemic: (a) Typhoid Fever in a Circus,[2] July 22 to August 6, 1934; (b) Cocoanut Grove Nightclub Fire, Boston,[3] November 28, 1942

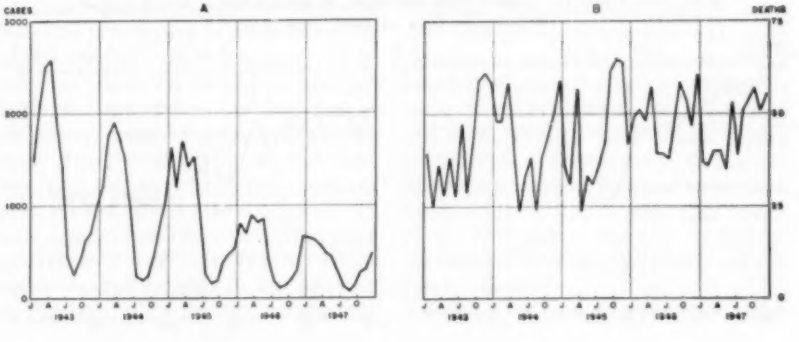


sharply as the troupe played Dayton, Ohio. The deaths from accidents which occurred in the 1942 Cocoanut Grove night club fire in Boston[3] were of the same order, the result of a single causative agent striking once and leading to an explosive outbreak with subsequent scattered deaths due to a more resistant host or a lesser activity of the agent. The result of a Florida hurricane would serve equally well in illustration.

The classical outbreak of amebic dysentery[4] in 1933 in a Chicago hotel was characterized by three successive peaks in incidence, a cyclic distribution caused by periodic contamination of the water supply. A similar cyclic distribution of injuries occurred among soldiers of an infantry division in France in 1944, when three successive and distinctive outbreaks of cold injury and trench foot[5] followed major military activities and increased exposure to cold, with the central and major event readily identified as a consequence of the Battle of the Bulge.

Other diseases are characterized by a non-fluctuating endemic prevalence of which tuberculosis[6] furnishes a good example, case rates for the United States during the years 1943–1947 adhering closely to a level of about 90 per 100,000 population. Certain classes of accidents conform to the same pattern,

FIGURE 2—Annual Seasonal Incidence: (a) Scarlet Fever,[3] Massachusetts, by Months, 1943–1947; (b) Motor Vehicle Accidents,[3] Massachusetts, by Months, 1943–1947



notably home accidents,[7] where year after year the death rates show little variation, sometimes a few more than 25 per 100,000 persons, and uncommonly a few less.

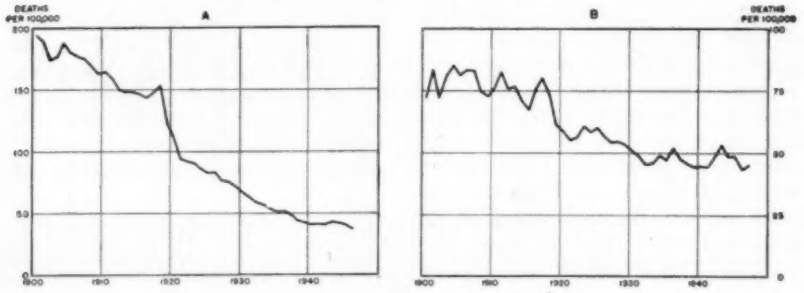
A well defined annual seasonal variation in frequency distribution is also a common characteristic of many communicable diseases. Scarlet fever in Massachusetts[3] regularly attains a maximum frequency in the winter months of January and February (Figure 2). An equally regular annual periodicity is shown by motor vehicle accidents[3] for the same state and for the same years illustrated, again a winter prevalence except that the peak develops somewhat earlier, in November and December.

The long-term trend in frequency distributions by time is another common method of evaluating the movements of disease, and a method that often serves importantly in determining the effectiveness of preventive measures that have been introduced. Injuries show typical trends (Figure 3), as definite as those of diseases, sometimes with frequency distributions maintained at a more or less fixed level, sometimes with a well defined tendency to move upward or downward. The downward trend in deaths from tuberculosis[8] in the United States during the present century is universally known, from close to 200 deaths per 100,000 population for the registration area of 1900 to a level consistently below 50 for the same region in the years since 1937. The frequency curve for deaths from accidents other than motor vehicle accidents[9] during the same period and for the same area was at a more or less constant level of about 85 per 100,000 during the first 10 years of the century; thereafter with a significant downward movement; with the past 15 years showing little variation although the level is now at about 50. Accidents as representative of the class of injuries evidently follow as distinctive movements in time as do diseases. It remains to determine whether the same biologic laws that govern occurrence and causation also act in respect to injuries.

ACCIDENTS AS AN ECOLOGIC PROBLEM

Irrespective of whether disease and injury be looked upon as affecting the individual, or as the mass effect exerted upon a community, causation is to be interpreted as something more than the agent directly involved, a germ in infectious disease or the loose board in a home accident. Rather it is a combination of forces from at least three sources, which are the host—and man is the host of principal interest—the agent itself, and the environment in which host and agent find themselves. Neither one nor

FIGURE 3—Long-Term Trend: (a) Deaths from Tuberculosis,[8] U. S. Registration Area of 1900, 1900–1946; (b) Deaths from Accidents, excluding Motor Vehicle,[9] U. S. Registration Area of 1900, 1900–1947



the other invariably exerts the principal effect, which provides the assumption that similar disease phenomena can arise from dissimilar causes.

An established and satisfactory equilibrium or adjustment between man and his environment leads to the situation called health. A significant disturbance of that equilibrium is the basis for disease or injury. The disturbance may occur either through principal action of the agent, because of a characteristic of the host, or as a function of environment, but most often through some combination of the three. These are the fundamental factors in causation. The mechanisms involved—how they interact to the eventual production of a pathologic condition, in pathogenesis of individual disease, or in the genesis of epidemics—is also a practical consideration, but the essential question is what are the basic causes of the disease or injury. This is true because remedy must be suited to the whole of cause, as it lies in host, agent, and environment. Can these broad biologic principles be fitted to an interpretation of injuries, as they have been to disease, whether communicable or non-communicable?

HOST FACTORS IN ACCIDENTS

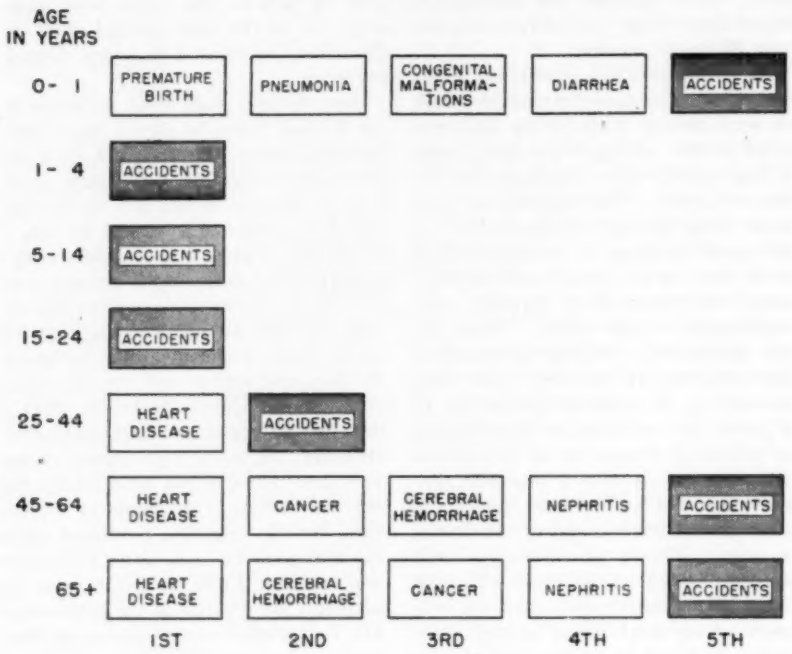
Because the object or agent which directly gives rise to an accident is so evident—the faulty pavement, the scalding water, the unguarded poison—the common tendency to consider only that factor in a causative relation is readily understandable. An enveloping darkness, or rainy weather, or a crowded tortuous thoroughfare are also not so difficult to interpret as contributing to accidents. But the people who get hurt, they are only the poor victims; and yet when the question is examined, probably more causes of accidents lie within what we choose to call host factors, within people themselves, than in any other of the three parts of the triad which explain disease and injury. The host patterns of persons who suffer from accidents are of the same general order as those long recognized in many disease processes.

Age—Deaths from home accidents in the United States in 1945[7] were most frequent among the very old, past 65 years, and among the very young, aged 0 to 5 years, with the loss of life far less during the active periods of life, 5 to 65 years, when conceivably the opportunity for accidents is greater and the risk much enhanced. The distribution of deaths by age is so like that for deaths from pneumonia and influenza of the same region and for the same year, in the United States in 1945,[10] that the two are almost interchangeable. However, the whole significance of age as a host factor is not revealed by the absolute weight of accidents at various ages, for the situation is altered when the interpretation is in terms of relative importance. While the death rates for accidents are greatest at the extremes of life, the problem centers among children and young adults[10] when considered according to rank among causes of death (Figure 4).

Sex—Difference in attack rate by sex is another characteristic useful in distinguishing community diseases; from the outstanding predominance of males over females provided by tularemia and undulant fever, where other features than sex evidently enter, to the regular although less marked excess of males that characterizes mumps[3] and other diseases of childhood. The spread between death rates for males and females for accidents of all forms[9] is noteworthy, and particularly so when selected types of accidents are compared. Fatal accidental injury through falls is more than twofold greater for females than males at age 65 years or more, a reversal of the experience during childhood and for young adults.

Race—Racial differences in attack

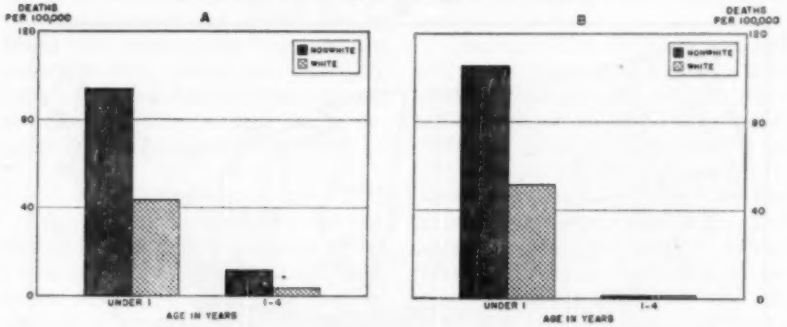
FIGURE 4—Principal Causes of Death,[10] by Age, United States, 1945



rates at earlier ages in a disease such as whooping cough[10] are well known, but they are no more striking than those noted for accidental suffocation[11] where the frequency is twice as great for colored children under 1 year as for white infants (Figure 5).

Genetic Inherent Susceptibility—The demonstrated differences in liability to accidents among populations separated according to the gross qualities of age, sex, and race are further confirmed by attention to any number of other features which enter into the constitution of the host as a whole, deficiencies in sight and hearing, and in mental stability to mention a few. Accident proneness is a host factor related to social attitudes and psychologic differences, and yet apparently is as inborn and fixed as any other inherited characteristic. The subsequent experience of motor car drivers who had no accidents in the first year of driving was compared by Farmer and Chambers[12] with those who had three or more. The accident prone drivers continued regularly to have more accidents during the next four years, a relation that held despite weather and other environmental conditions which introduced expected fluctuations in the frequency curve. Accident proneness is no unique function of motor accidents but enters into accidents of all types, although less well explored for such important groups of accidental injuries as those that occur in the home. The inherent differences among people in this attribute are as distinct as those underlying the excess incidence of acute upper respiratory infections[5] among white as compared with

FIGURE 5—Racial Distributions: (a) Deaths from Whooping Cough,[10] United States, 1945; (b) Deaths from Accidental Mechanical Suffocation [11] United States, 1939–1941; Children under 5 years, White and Non-White



colored troops, a phenomenon recorded in World War II, and in similar relation whether the endemic common cold or epidemic influenza prevailed.

AGENT

The agents concerned with injuries and with accidents, like those of disease, are variously of physical, chemical, and biologic nature. The importance of the several classes is greater in some types of accident than in others and the kind of agent within a class is potentially great. Information about the agents concerned in accidents is none too satisfying because of the common failure to distinguish mechanism from actual agent.

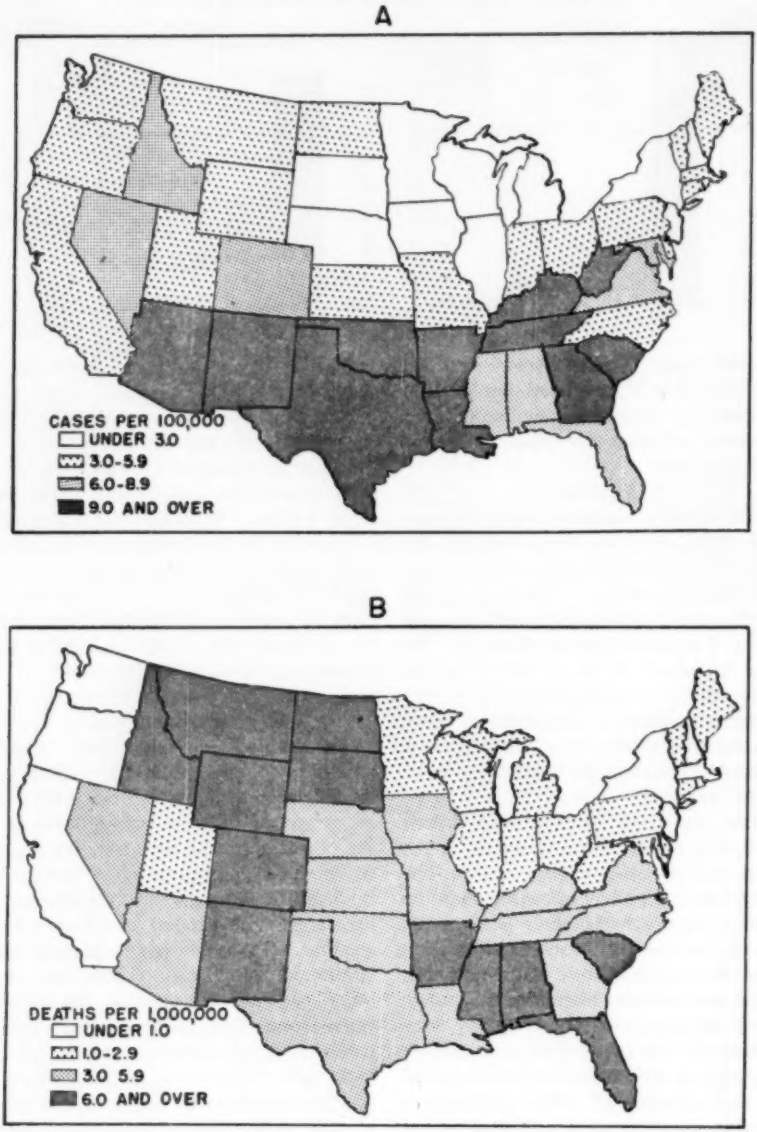
The causative factors in accidents have been seen to reside in agent, in the host, and in the environment. The mechanism of accident production is the process by which the three components interact to produce a result, the accident; it is not the cause of the accident. Kinds of mechanism serve to advantage in classifying accidents by type, with a particular event ascribed to cutting or piercing, to collision, or to crushing, and yet the agent in all three instances is a glass panelled door. Conversely, a fall may be related to such dissimilar agents as a faulty ladder, a playful pup, or a misplaced handbag.

The significance of agents in the problems of causation becomes more apparent when the kind and concentration are related to the same fundamental features of time-place-person relationship that is the basis of the epidemiologic method. This may be illustrated (Figure 6) by the geographical distribution of cases of typhoid fever [13] and of deaths from lightning,[14] with the dominant "reservoirs of infection" and factor of community dosage as evident for the one condition as for the other.

ENVIRONMENT

The limited perspective with which environment is commonly viewed is open to improvement by considering it as composed of three major elements, the physical, the biologic and the socio-economic, a concept elsewhere discussed in detail.[15] The physical environment has to do with matters of climate and weather, of season and topographical affairs, with soil and terrain, and the other physical features of the world where man lives. The biologic component of the environment can be taken to include the universe of living things that surrounds man, all else than man himself; while the socio-economic part of environment is that which comes into play through association of man with his fellow man. Environment so con-

FIGURE 6—Geographical Distribution: (a) Cases of Typhoid and Paratyphoid Fever,[13] United States, 1940–1944; (b) Deaths from Lightning,[14] United States, 1940–1944



sidered exerts an influence on disease sometimes through direct action on host or on agent, and sometimes on the mechanisms which bring host and agent

together or determine their interaction. The results of environmental influences are to be measured by the character of the disease process that results, by the extent and nature of the frequency distributions that follow, and often by both. The three factors of environment are now considered as they act in determining distributions of accidents.

PHYSICAL ENVIRONMENT

The geographic differences in frequency of deaths from accidents of all forms are well recorded in the United States over many years; the highest rates are in the far West and in Florida, the lowest in the Middle Atlantic and New England areas.[7] The general pattern by no means holds for the various classes of accidents, notably home accidents, nor does the gross differentiation by states permit the individual community to judge its particular problem logically. This has been recognized to the extent that some cities determine the frequency of accidents by political subdivisions such as wards or census tracts, and states like Tennessee[7] and Kansas[21] have effected divisions by counties. Further division can be made according to classes of accidents, for example, those that occur in the home or in association with motor vehicles.

The contrasting frequency of diphtheria and scarlet fever in the cities of Sao Paulo and Santos in Brazil is a striking example of the effect of climate[16] on disease. The average annual mortality rates per 100,000 in Sao Paulo were for diphtheria 10.8, for scarlet fever 7.6; in Santos, diphtheria 3.1 and scarlet fever 0.3. The two cities only 49 miles apart are climatically wholly distinct since Sao Paulo high in the mountains has a temperate climate, while Santos is on the tropical sea coast. An equally striking effect of temperature is seen in the frequency of cold injury among American troops in France in World War II.[5] As temperatures dropped from November through January, the number of soldiers developing trench foot progressively increased.

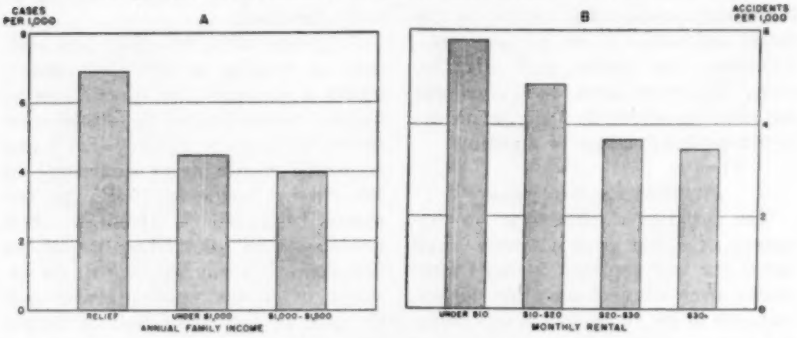
A seasonal effect on injury and accident as striking as any that characterizes a communicable disease can be had by comparison of the distribution curves for cases of poliomyelitis[13] and accidental deaths from drowning[7] in the United States in 1945, the two curves being almost identical. This random choice illustrating a summer prevalence is easily duplicated, for instance by deaths associated with falls at all ages and suffocation of infants aged less than one year, which are typically winter diseases. The examples are sufficient to establish the principle that types of accidents have seasonal variations which can be as regularly recurring and as well marked as those for infectious or other disease processes.

The frequency of ascariasis in a rural area of West Virginia and in rural China is presented as an influence of soil and terrain on the frequency of infestation with an intestinal parasite. The rates for children under 10 years were respectively 58 per cent and 82 per cent. The introduction in West Virginia of the socio-economic factor of shoes being worn as age advances leads to comparative rates of 20 per cent and 63 per cent for those aged 40 years or more. Terrain can likewise act on motor accidents, as seen in a comparison of death rates in Rhode Island and in Arizona, where the regularly maintained ratio is 1:4 although assuredly analysis would show strong effects for socio-economic environment and from host factors, in addition to the character of the countryside.

BIOLOGIC ENVIRONMENT

The biologic factor of environment has a lesser significance in the causation of accidents, compared with the outstanding part it plays in such mass dis-

FIGURE 7—Influence of Socio-economic Environment; (a) Pneumonia,[18] Cases per 100,000, by Annual Family Income, National Health Survey, 1935–1936; (b) Home Accidents,[18] Cases per 100,000, by Monthly Rental, National Health Survey, 1935–1936



eases as malaria and rabies. That the principle holds, that environment in relation to accidents is also to be interpreted in terms of the three components already differentiated, is substantiated by a consideration of such events as the home accidents associated with pets, with poisoning through action of snakes and arthropods, and similar incidents related to the animate things that live with man.

SOCIO-ECONOMIC ENVIRONMENT

Whatever the kind or nature of mass disease or injury, the part exerted by the socio-economic environment is probably the most neglected of any epidemiologic influence, and accidents are not different in this respect from any other causes of damage. Only scattered information can be put together, that arising from the National Health Survey of 1935[17] being most instructive. The quality of housing (Figure 7) as judged by the amount of income or rental paid has been repeatedly demonstrated as an influence on the frequency of both communicable and non-communicable disease. It is not surprising that the same causative factors which act so strongly on the frequency distributions of pneumonia[18] are also a determining influence with accidents.[18]

The demonstrated correlation between disease and occupation, as in tularemia[19] where hunters and housewives are the groups most affected, is in complete agreement with the differences noted for accident rates according to occupation.[7] Deaths per 100,000 for persons engaged in mining, quarrying, oil and gas wells were in 1947 about 170; for construction work and those in agriculture about 50.

The changing frequency in the incidence of the common communicable diseases among rural and urban populations is commonly advanced as a feature of modern disease behavior related to social and economic conditions. It is no more definite than the transition noted for motor accidents.[10] Deaths from this cause were dominantly a feature of urban populations 25 years ago, but the recent shift is of such extent that rural death rates now exceed those of urban areas.

THE EPIDEMIOLOGIC APPROACH TO ACCIDENTS

The idea that injuries as they affect groups of people could be profitably approached through epidemiologic methods grew out of a real and pressing experience in World War II. A type of cold injury, trench foot, involved

thousands of men, and was a major cause of disability and lost man power. The initial inclination was to look upon the cause as cold, which could neither be eliminated nor adequately controlled in an army operating under field conditions. If not cold, then the cause was deficiencies in clothing and equipment. It soon became apparent that other factors were of greater relative moment, the kind of military operations, the terrain through which troops operated, the management of troops, and an intangible host factor called foot discipline. Occupational components of a division were not uniformly affected, for commonly some 94 per cent of cases were among the 27 per cent of riflemen. Two units operating under similar conditions were disproportionately affected, and the explanation was sometimes related to host, sometimes to the agent, and sometimes was found within the environment. The problem of prevention resolved into a determination of the specific factors contributing to cold injury of a particular unit. From knowledge of those factors a specifically directed program of correction was evolved.

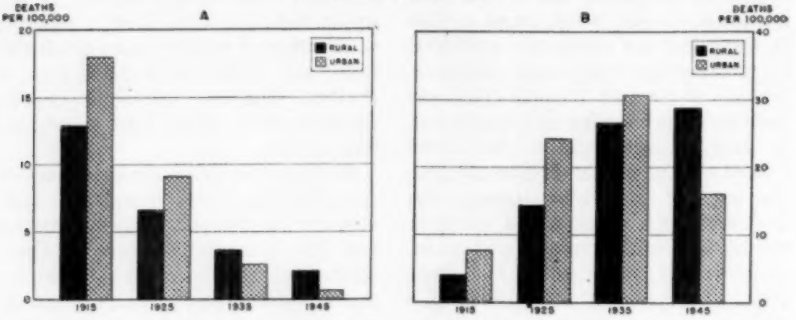
With a return to civilian interests, it seemed reasonable to suppose that accidents as a type of civilian injury could be approached in similar fashion and a study was made of home accidents. The broader presentation given here is advanced in the belief that the method is usefully applicable to accidents generally.

That accidents and disease, as they affect groups of people, so frequently show similar distributions is no reason to assume identical causes; indeed, the expectation is that they are different. The illustrations presented here were purposely drawn from a wide variety of accidents and diseases, to the end of demonstrating that both great classes of morbid conditions of man are governed by broad biologic laws; that in their action on groups of people they are the resultant of the total forces within a universe, of an ecologic entity. An observed behavior is no more a function of all kinds of accident than of all diseases, and conversely a single type of accident, like an individual disease, rarely manifests all the kinds of possible distributions.

Each of the three broad factors in causation has been considered individually to the end of demonstrating principle, but the illustrations themselves, and more particularly the concept of epidemiology as medical ecology, show this to be an over-simplification. All factors are intimately interwoven, each influenced by the other. For a given kind of accident the values are determined by subjecting adequate quantitative data to partial and multiple correlations in search for those conditions of actual importance in the particular situation. Too often the emphasis is on amassing facts with a failure to muster the power that likes in generalization, to develop information from principle or to collect data for a specific purpose and to meet a demonstrated need. A wide range of conditions commonly contributes to the prevalence of an injury. The success of a control program depends on sorting out from the larger volume those that are critically essential. These considerations make epidemiologic analysis a practical approach to an improved understanding of accidents and to a better prevention.

The start is through field investigation, individual case study of the patient, the family group, and the immediate surroundings in which they live. Neither disease nor injury in a community can be effectively prevented or controlled without knowledge of when and under what conditions cases are occurring. The method is fundamentally that so well developed for communicable and other diseases. The nature of the accident is determined, the result evalu-

FIGURE 8—Urban and Rural Distributions: (a) Deaths from Diphtheria,[10] per 100,000 population; (b) Deaths from Motor Vehicle Accidents,[10] per 100,000 population; United States, 1915–1945



ated in terms of death or recovery, of temporary disability or permanent defect. The causes are sought through direct investigation of the site of the accident, of the associated circumstances, and of the person who was injured. A principal difficulty is in unearthing the index case, in case finding, for the system of reporting so useful in the study of communicable disease and some few other conditions, is not available for accidents. Deaths from accidents are reported, but what is needed is something more than a knowledge of fatal accidents.

Death is far from being the sole health cost of accidents,[20] or for that matter of any mass health problem. Estimates suggest that for every death from a home accident, some 150 disabling accidents occur, a ratio that is greater than for any other of the accepted classes of traumatic injury. Patients admitted to hospitals serve as a lead to the group likely to suffer permanent defect from accidental injury, for presumably they are the more seriously injured. The kind of information basically essential to a comprehensive preventive program is that which relates to the bulk of lesser events, the accidents that result in temporary and often minor disability. This is to be obtained most surely through organized survey and special studies in selected areas. Much can be accomplished by incorporating the investigation of accidents into the ordinary activities of health departments where public health nurses and others include a consideration of accidents along with other activities which take them to the homes of people.

An analysis of collected data according to the pattern described is believed helpful in understanding the origin of accidents, since it provides a framework into which endless scattered observations can be fitted. It involves first a recognition of the agent involved, second a determination of the mechanism by which that agent comes into play, and thirdly a definition of cause in terms of combined effect originating from host, agent, and environment.

This is not a complicated but a rational and practical approach to the study of accidents. It is a scheme followed by several health authorities.[21] The National Safety Council[22] has made an analysis of home accidents according to this pattern. The investigation form used by the Kansas State Health Department provides a simple means for acquiring and recording necessary data. The method needs wider application if the problem in the individual community is to be adequately met, for it provides the intelligent and specific information upon which to build a program of prevention.

CONCLUSIONS

Specifically directed prevention based on an understanding of cause has long guided the attack on communicable and other diseases. The technical method is that of focal attack, a concentrated effort on recognized centers of infection and the causes that brought them into being.

The biologic principles that govern disease as a community problem are interpreted as holding equally well for injuries. A pattern for epidemiologic analysis is presented as a means for a better understanding of accidents, and thereby through improved measures of prevention, a lesser cost in death, defect, and disability.

REFERENCES

1. Metropolitan Life Insurance Company. *Stat. Bull.*, 29:4 (Apr.), 1948.
2. Miller, K. E., and Miller, H. E. A Report on an Epidemic of Typhoid Fever in a Circus. *Pub. Health Rep.*, 50:778, 1935.
3. *Annual Reports on the Vital Statistics of Massachusetts*, Boston: The Commonwealth of Massachusetts.
4. Epidemic Amebic Dysentery: The Chicago Outbreak of 1933. National Institute of Health *Bull. 166*. Washington: Gov. Ptg. Office, 1936.
5. Gordon, J. E. *A History of Preventive Medicine in the European Theater of Operations, 1941–1945*. Washington: Office of The Surgeon General, Department of the Army, 1948.
6. Halpin, E. H. Tuberculosis Mortality in the United States, 1946. *Pub. Health Rep.* 63:1029, 1948.
7. *Accident Facts*. Annual publication, Chicago: National Safety Council.
8. *Vital Statistics of the United States, Department of Commerce, Bureau of the Census and Tuberculosis Reference Statistical Yearbook*. New York Tuberculosis and Health Association, 1947.
9. *Vital Statistics of the United States*. Department of Commerce, Bureau of the Census and Accident Facts. Chicago: National Safety Council.
10. *Vital Statistics of the United States*. Department of Commerce, Bureau of the Census and Federal Security Agency, U.S.P.H.S.
11. Wolff, G. Childhood Mortality from Accidents. Washington: U. S. Department of Labor, Children's Bureau, *Publ. 311*, 1945.
12. Farmer, E., and Chambers, E. G. A Study of Accident Proneness among Motor Drivers. Medical Research Council, Industrial Health Research Board, *Rep. 84*. London: H. M. Stationery Office, 1939.
13. The Notifiable Diseases: Prevalence of Certain Important Communicable Diseases, by States. *Pub. Health Rep. Supp. No. 103*, 1945.
14. Metropolitan Life Insurance Company, *Stat. Bull.* 28:6(June), 1947.
15. Gordon, J. E., and Augustine, D. L. Tropical Environment and Communicable Disease. *Am. J. M. Sc.*, 216:343, 1948.
16. Doull, J. A., Ferreira, M. J., and Parreiras, D. The Results of the Schick and Dick Tests in Rio de Janeiro. *J. Prev. Med.*, 1:513, 1926–1927.
17. Perrott, G. St. J., Tibbitts, C., and Britten, R. H. M. The National Health Survey: Scope and Method of the Nation-Wide Canvass of Sickness in Relation to its Social and Economic Setting. *Pub. Health Rep.*, 54:1663, 1939.
18. Britten, R. H. Illness and Accidents among Persons Living under Different Housing Conditions. *Pub. Health Rep.*, 56:609, 1941.
19. Jordan, C. F. *Iowa Pub. Health Bull.*, 54:11, 1940.
20. Safety for the Household. National Bureau of Standards, *Cir. 463*. Washington: Gov. Ptg. Office, 1947.
21. *Kansas Accidental Death Report*. Topeka: Kansas State Board of Health, 1947.
22. James, W. C. Personal Communication. Chicago: National Safety Council.

Southern Branch A.P.H.A. To Meet in Dallas, April 14-16

The Southern Branch of the American Public Health Association will hold its 1949 meeting in Dallas, Tex., as announced, April 14–16 with headquarters in the Baker Hotel. John M. Whitney, M.D., formerly Health Officer of New Orleans, now with the American Red Cross, is President and George A. Denison, M.D., of Birmingham, Ala., is Secretary-Treasurer.

The preliminary program announces sessions that will include discussions of present trends in public health, medical research in public health, the tax dollar in public health, the importance of immediate personnel policy planning, water pollution, nursing for the future, rabies control, statistics in public health, dental caries, nutritional status of southern persons, early detection of cancer, public relations in health services, attracting young physicians into public health; together with special sessions on nutrition, nursing, laboratory, sanitary engineering, statistics and health education.

Bacillus subtilis, an Interfering Organism in the Enterococci Test

GRACE McCORMACK

U. S. Department of the Interior, Fish and Wildlife Service, Branch of Commercial Fisheries, College Park, Md.

IN testing the extent of fecal pollution of water and clam samples, the Enterococci Test of Winter and Sandholzer (*Technological Leaflet No. 2*, Fish and Wildlife Service, U. S. Department of the Interior, 1946) was run in parallel series with the coliform test. The inoculum was 10, 1, and 0.1 ml. of water or clam broth. All of the cultures which gave a positive or partially positive enterococci presumptive test were Gram stained. The results revealed that not all positive presumptive tests are caused by the presence of enterococci. Many times a Gram-positive, rod-shaped microörganism appears as a mixed culture with the enterococci, and sometimes, the color change is caused solely by this organism.

Since this organism appeared to belong to the genus *Lactobacillus*, the cultures were transferred directly to tomato juice agar slants, for further study. Later, differential tests showed that this organism was not a member of the genus *Lactobacillus*. Gram stains of old original cultures showed the presence of many spores, not apparent in a 24 hour culture.

Twenty-five cultures were given differential tests with twelve different sugars. The tests were found to agree in every case. Gelatin was hydrolyzed. Citrates were utilized. Acetylmethylcarbinol and nitrites were produced.

It is evident that the microörganism which interfered with the reliability of the enterococci presumptive test is *Bacillus subtilis*. A stock culture of this organism, as well as one obtained from the American Type Culture Collection, were run in conjunction with the differential tests on the isolated cultures. Similar results were obtained.

It is necessary to run the catalase test in order to differentiate between the enterococci and *B. subtilis*. If the growth of the Gram-positive rod-shaped organism is small, it is very difficult to detect a positive catalase test which is characteristic for *B. subtilis*. Of course, a differentiation can be made by Gram staining the cultures. All cultures were found resistant to large doses of penicillin.

Use of Auxiliary Personnel in Dental Care Programs*

R. M. WALLS, D.D.S., F.A.P.H.A.
Dental Consultant, Bethlehem School District, Bethlehem, Pa.

AT the annual meeting of the Committee on Administrative Practice of the American Public Health Association, held October 9, 1943, the Subcommittee on Medical Care was directed to draft a set of principles expressing the desirable content of a comprehensive program of medical care, the methods of its administration, and the part which public health agencies should take in its operation. The report eventually, by action of the Association on October 4, 1944, became an official statement of the A.P.H.A.[1]

The study was considered but one sector of a comprehensive national health program, namely, medical care. The report states, under recommendation VI "Training and Distribution of Service, Personnel," b, that "The plan should provide for the study of more effective use of auxiliary personnel (such as dental hygienists, nursing aides, and technicians) and should furnish assistance for their training and utilization."

The study of the more effective use of auxiliary personnel for the dental profession was assigned to Nathan Sinai, Edwin F. Daily, and R. M. Walls. This study has not been completed and is not ready to be presented to the committee, hence the material offered here represents the views of the author alone.

According to O'Rourke[2] there are five or six trained auxiliary workers for each physician and approximately two-thirds of such aid for each dentist. At first there was much opposition to the formal training and the registration of nurses. But while there was one nurse to each physician in 1920, in 1940 there were two to each physician. This is but one example of the evolution of auxiliary groups in the medical field. The physician has been wise in delegating so many services to ancillary aides —from the construction and fitting of artificial eyes and limbs to the multitude of laboratory technics.

The dental profession has been very reluctant and slow to accept the services of auxiliary personnel. The "chair assistant" has assisted the dentist for a century and, according to Klein, those who avail themselves of such well trained aides increase their service to the community 25 to 50 per cent, yet today less than one-half of the profession have such assistants. Dentists have been required to spend most of their time meeting the demands for fillings and restorative appliances for adults. Some items have been delegated to specialists, but, as compared with a solution of the whole problem, this delegation has not been significant.

Many dentists or groups of dentists avail themselves of the services of prosthetic laboratory technicians, either working under close supervision or off the premises under no direct professional supervision. This type of auxiliary worker undoubtedly saves the dentist many hours in actual labor, but little

* Presented before a Joint Session of the Dental Health and Medical Care Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 11, 1948.

of this time helps to produce more chair hours because it is rare that a dentist who can otherwise fill his chair-time hours will spend such time in his prosthetic laboratory, and so such work is done during the evening. It can truthfully be said that the use of the laboratory technician as an auxiliary worker does not make more chair-time available so that more patients may be served by the dentists.

The only auxiliary operator in the dental field that has legal status is the hygienist, and the tumult that raged within the profession at the time of the conception of this new idea may still be heard each time that a state attempts to amend its laws to permit the licensing of hygienists. In the first decade of the 20th century, Dr. D. D. Smith of Philadelphia, propounded and demonstrated some of the potentialities of dentistry as a health service. Dr. Alfred C. Fones, of Bridgeport, Conn., was so impressed with the work of Dr. Smith that he conceived the idea that the subject of oral health was of sufficient importance to warrant the training of individuals who would devote their chief energies to dental prophylaxis and dissemination of information to the public, through the schools, in regard to the value of a clean and properly functioning oral cavity to personal health. As a result of Dr. Fones's indefatigable efforts, a school for dental hygienists, with a faculty which has probably not been equalled since, was established in Bridgeport in 1913. Since that time the dental hygienist has been licensed by 38 states, and almost without exception has become recognized as an important ancillary to modern dental health service, yet they are found in only 4 per cent of dental offices. This auxiliary operator, without proving a threat to the established form of dental practice, has so conclusively demonstrated her worth to both institutional service and private practice that she has become as essential to modern dentistry as the registered nurse is to modern medicine. In private practice the great majority of her patients are adults; it would be of great significance if the time that is saved by her employer were spent in rendering service to children.

How do our educational facilities measure up to the problem of supplying sufficient graduates in dental surgery to meet the present-day need?

It is interesting to note that in 1900 there were 57 dental schools, in 1921 45 dental schools, and in 1933 but 39. At the present time there are 41 schools, only two of which offer dental training on a large scale to the Negro. Horner[3] states that many factors enter into the fixing of the numbers of students in dental schools and the number that are graduated, such as wars, depressions, and changing entrance requirements. The highest enrollment since 1925 was 9,014 in 1943, and the highest number of graduates since 1928, 2,470 in 1944. This increase was due to the accelerated plan of instruction operating during the war. The lowest enrollment since 1925 was 7,160 in 1933, the result of the depression in 1929. The lowest number of graduates since 1930 was 1,568 in 1941. This decrease was in part due to the effects of the depression, and in part to the increased requirements that went into effect in 1937.

If we accept Horner's figures, the number of dentists in this country in 1941 was 75,685 or 1 to 1,740 of population; in 1945—77,188, or 1 to 1,801 of population; and he estimates for 1950—76,632 or, 1 to 1,933 of population.

These data of Horner's[3] show an estimated loss of dentists, steadily, after the year 1947. Even with the creation of three new dental schools, which should provide the graduation of 2,500 dentists per year, and if from 1950 to 1960 we should have the expected increase in population of 6 per cent, we would have 82,500 dentists in 1960 and a popula-

tion per dentist of over 2,000. Thus it would appear that our population per dentist for the 3 decades from 1930 to 1960 will show a progressive increase and that the provision for dental care will be less in 1960 than it was in 1930.

If the many programs of health education in the past 3 decades have had the desired effect, there will be greater demands for dental services in general. Improved methods of transportation are making dentistry available to many in the rural areas. Organized groups are including dental services in their health programs. The new Army program will further disjoin the dentist: population ratio.

Says Morrey,[4]

> Since the number of graduates from dental schools is influenced by many things which upset the increase in the number that should be expected to take care of normal growth of the population and since it requires so many years to reëstablish this normal output, all plans for the expansion of dental service to the population are put in jeopardy, it would seem to me that some other plan for increasing the man-power is in order.
>
> There is no disputing the fact that, during the past fifteen years, the supply of dentists has not kept abreast of the public appreciation and demand for service; and that as a result, in the United States, dentistry is seriously undermanned. Any dental program, whether inaugurated on a national, state, or local level, must take that fact into serious consideration. Judging from existing figures and by the upward trend in public appreciation of dental service, it seems safe to predict that the dental profession will be barely able to meet current dental demands and that, under present methods of practice, the profession will be exceedingly over-taxed to supply anticipated future demands.

Again quoting from Morrey[5]:

> Until that day dawns when therapeutic measures can be employed to prevent dental caries, the dental profession should bend its every effort and the efforts of its auxiliary forces toward controlling caries by the most practical method known at the present time, namely, dental operative procedures for children. This is not a new formula, on the contrary, it is one that has been advocated for many years. Unfortunately, it has never been wholeheartedly accepted by the public, and it has been accepted only in principle, but not in fact, by many members of the dental profession.

Klein[6] has made a rather exhaustive study of the needs of the population and has estimated the number of chair-hours that would be required to take care of the accumulated needs and the yearly incidence of decay. Time will permit but one quotation: "The yearly crop of dental need in the whole American population requires for its service probably at least double the present volume of dentists, that is, instead of 65,000 dentists, at least 130,000 are required, just for yearly maintenance." It is interesting to note that in the 107 years since the first dental graduates were sent forth there have been but 126,500 following in their footsteps.

Unfortunately the child suffers most from the lack of man power, pointed out so convincingly by Klein. There are but two or three hundred dentists in this country who devote their entire time to dentistry for children, while the general practioner seems largely indifferent to the needs of the child. Children are apt to be difficult patients, making it hard to render good service and, in the hands of most operators, limiting the types of materials that may be used for fillings. Rarely are inlays indicated or possible; rarely are crowns and bridges inserted. Dentistry for children is not made available in many offices because it brings comparatively small financial returns. Yet children should receive more dental service, beginning at a very early age and on a constantly continuing basis.

Consider just one of the ills that beset the child who does not receive dental care: the early loss of deciduous teeth and of the six year molar—resulting in the drifting of teeth—is one of the greatest causes of malocclusion of the jaws. It has been estimated that 60 per cent of children today have malocclusions that should be treated by the orthodon-

tist. The services of the orthodontists are necessarily costly, and there are far too few to serve the need. Such services are but rarely available to those in the low income group; very few clinics offer such services to the indigent.

Bauer[7] states that the fact that the child receives secondary consideration was impressed forcibly upon the laity and the profession in the reports of Selective Service. He feels that the lack of financial returns, poor patient management, the lack of preparation provided by many schools, and the subordinate place of pediodontics in state board examinations are responsible for this lack of service.

Salzmann[8] observes that it requires a general depression such as was experienced in the early and middle 30's to make the profession turn toward meeting the needs of children, and that during the war and since then, pediodontics has reached a very low ebb. The American Dental Association and various state and local dental societies, recognizing this trend, made appeals on professional as well as patriotic grounds that children be given priority appointments, but in spite of a high per cent of pledges by the profession, in actual practice it was found that children were not being favored. Salzmann goes on to state "that between the unwillingness of the private dentist to meet his responsibility to children and the growing demand upon the part of interested lay groups, it may well be that the provision of dental care for the children will be taken out of the hands of the profession altogether. Already there is talk of developing auxiliary workers to care for the children."[9, 10]

Jeserich[11] states it this way:

> The present regime of practice demands a heavy concentration of effort and thinking on technical procedures, based vaguely on a rather confused background of biologic principles with a gradually fading consciousness of their significance and as a result a waning effort to correlate them with clinical practice. More hands especially trained for technical procedures under the direction and supervision of the licensed dentist . . . with a practice regime permitting the use of this concept to guide his and the hands of others, would seem to be desirable from the points of view of both quantitative and qualitative service considerations. Part of medicine's greater appeal when compared with dentistry is due to the fact that it affords an opportunity to use the mind without so much emphasis on technics. Dentistry's thinking is too fettered to technics by the nature of its present system of practice. In medicine, nurses, technicians, interns, and other aides make it possible for one mind to direct and guide several hands and minds trained to be auxiliary aides.
>
> The dental profession seems to fear that something will be taken away from it whenever the creation of any group of auxiliary aides is discussed. As long as these aides are under the immediate supervision of properly trained ethical practitioners, and have had adequate training for their limited function, such fears do not seem logical and would appear unwarranted. It would be more logical to presume that something was being given to the profession rather than taken away, both from the objective of quality and quantity of service and from the point of view of economic considerations favorable to the profession as well as to the people served. The violations of auxiliary aides would be dependent entirely upon the ethics of the licensed practitioner, and in the last analysis the profession of dentistry. There would have to be a deliberate breach of ethics or law by the profession to have violations. Are we afraid of ourselves or the auxiliary aides?

I would like to quote Elam[12]:

> It is my considered opinion that the time has come when the dental profession must broaden its auxiliary services if it expects to meet the increasing demands upon it. At the same time it must protect its present standards of dental education and exert firm control over all phases of dental service. . . . The fact is, as I see it, the dentist without help cannot possibly supply the demands for all dental services. The demands are increasing daily and unless the demands are met by the profession, other agencies will seek to supply them. This can be done in many ways as has been attempted in other countries. The only solution for the profession, to meet its obligation to the public, is to accept, train, and control all the help that it needs.

Since the number of new graduates entering practice each year is not to any

great extent exceeding the number of practitioners who retire or die annually, it is obvious that making dental service more readily available to the public cannot be brought about for many years by merely adding to the total of practitioners in the usual way. The previously mentioned committee of the A.P.H.A. is well aware of this fact, and after reviewing the present use of auxiliary personnel by the dental profession—the hygienist, the chair assistant, the laboratory technician, as well as the use of multiple operating units—finds that these present practices fall far short of producing the man power hours required to meet the present demands for dental service and that the development of a new type of auxiliary worker should be considered, if more extensive public health programs in the dental field are to be made possible.

A study of the system in use in New Zealand has been made and brings to light the following: The government in 1919, reviewing the health of its armed forces during World War I, determined to do something about the dental health of its children, and instituted the New Zealand School Dental Service. In 1920 Col. T. A. Hunter, C.B.E., Director of the Army Dental Service during the war, was appointed Chief Dental Officer of this post-war service.

Colonel Hunter's proposals were considered revolutionary but eventually the New Zealand Dental Association gave its formal approval of his proposals and the first draft of young women to undergo training as dental nurses was appointed in 1921.

This service, created by the government, organized and controlled by the Director of the Dental Division of the Department of Health, was organized in six units, each of which is controlled by a senior dental officer who is directly responsible to the director. These officers are the Principal of the Dominion Training School for Dental Nurses, and the Senior Dental Officers in charge of the five dental districts into which the Dominion is organized.

Graduate school dental nurses are officers of the Department of Health, but they are "attached for special duty" to the staff of the school at which their clinic is situated. While they come under the general jurisdiction of the Headmaster, their actual controlling officer is the Senior Dental Officer who is assisted by a staff of inspectors and assistants.

The school dental nurse receives her training in a special school at Wellington. The applicant must be a young woman with high physical fitness, good personality, between the ages of 17 and 25 years. She must have passed, as a minimum requirement, the university entrance examination or school certificate examination. She must agree to serve for not less than five years, including the two years training period. The cost of the training is borne by the government.

The curriculum is well planned to provide the student with the ability, among other things, to fill and extract deciduous and permanent teeth. The senior Dental Officer or his aides are consulted in regard to any patients who present conditions which appear to require special treatment. Health education is stressed, so that the patients may be instructed in the principles of oral hygiene and the preservation of the teeth.

There is no means test. All children are eligible, irrespective of the social or financial position of their parents. Attending school is a prerequisite to obtaining dental treatment, except in the case of preschool children and adolescents. It is necessary to enroll while in the primer classes, that is, not later than the second year of attending school but enrollment during preschool age is preferred and encouraged. It is interesting to note that eligibility for the ex-

tended service that embraces the adolescent group is contingent upon a person having undergone regular treatment up to within three months of the time of application, either at a school dental clinic or at the hands of a private dental practioner.

Every patient is required to undertake: (a) to attend for treatment or examination at such times as may be required; (b) to apply for treatment as soon as he becomes aware that treatment is needed; (c) to apply for examination at an interval of six months from his completion (the responsibility for this is placed on the system, but the patient should draw attention to any omission to call him up); (d) faithfully to carry out such instructions as are given in regard to oral hygiene and dental health.

If a patient should fail to report within twelve months of his previous completion, his name may be removed from the roll. He may be reënrolled if he has his dental condition restored to a satisfactory standard at his own expense.

The school dental nurse supplies the service for the child until he reaches the age of 13. Not more than 500 children may be assigned to one nurse. The adolescent group, recently included in the program, is served by dentists.

The annual report for 1946–1947 shows that for the year ending March 31, 1947, there have been established 456 treatment centers; the staff numbered 679 including 206 student dental nurses. There were 423 school dental nurses in the field. There were 226,798 children under treatment; 2,313 schools were embraced in the treatment areas. From the report I note a ratio of 6.3 extractions to every 100 fillings, which is quite a contrast to 114.5 extractions per 100 fillings in the first year of the program. The cost of the service per child was approximately £1 per annum. The costs include salaries, maintenance of hostels for housing the student nurses, and buildings. The school dental clinics in the field are built by the Educational Department and are not included in the cost figures. The cost of training a dental nurse in the last yearly report was given as £600 for the two years. Against this figure is assessed the value of the clinical services which are rendered during the second year, of £200, making the net cost of educating the dental nurse £400. I have long been of the opinion that this program which has been in operation in New Zealand for 27 years, if introduced into this country would in time solve the problems that have been stated by Morrey, Salzmann, Elam, Klein, Jeserich, Millberry, Clawson, McCall, and others.

I have discussed with the deans of several dental schools the possibility of producing a course comparable to the one given in New Zealand at the training center for school dental nurses in Wellington. Without exception these men stated that it would be possible to provide a similar or better course of instruction at their institutions.

Clawson[13] said recently that he and his colleagues at Meharry have given considerable thought to a plan which is based on their willingness and ability to offer a curriculum from which all subjects not essential for dentistry for children would be eliminated and only those subjects absolutely essential to good children's dentistry would be retained, in a two years course. I must refer you for further consideration of the rather elaborate plan to Clawson's complete statement, but let me quote briefly: "We would give it a trial tomorrow if I could find one state board that would give a licensing examination to the product of the course."

I have presented the picture of the present lack of dental personnel and the rather dubious outlook for the reduction in the future of the dentist; population ratio. I have not included

in this presentation an estimate of what proportional changes may result as the "draft" program gets underway, because at this time the picture is not clear.

I have very briefly outlined the need; it is so very well known to all of us. I have quoted various men, prominent in the dental health and educational field, who believe that an extension of the type and use of auxiliary personnel by the dental profession is indicated. I have given a concise statement of the system that has been in vogue in New Zealand for 27 years. I have quoted a plan that has been projected by a well known dental educator, who has had vast experience in dental education at home and abroad.

I am not unmindful of the strides that have been and are being made by scientists in their determination to discover the cause of dental decay and to apply their knowledge. The men who are outstanding in this field do not anticipate more than a 40 per cent decrease in the dental caries rate. Presupposing that, as a result of a general application of new knowledges, the adolescent enters adulthood with better teeth and more of them, and the life expectancy continues to be pressed upward, then there will be more of the diseases of the oral tissues that come with age to be treated. Naturally the field of the dentist would be extended with this new demand and the children who would require service would still not find it available.

There is considerable difference between the need for services and the demand by the population. But I cannot agree with a statement made recently that the demand rather than the need for dental services should be the guiding principles in increasing the number of dentists and auxiliary personnel.[14] I believe that dental services for children should be made readily available to every child.

I have long been of the opinion that a healthy mouth should be a prerequisite for enrollment in school and a requisite for the continuance in school. All existing obstacles that deprive children in the low income families or children on farms or in other sparcely settled areas, or Negro children, of dental services, would be removed if the state departments of health would make this new type of periodontist available to the schools. Hand in hand with education should go a healthy mouth.

In the opinion of the writer, which is shared by many others, a research project should be undertaken on this continent, in the United States preferably, so that the utilization of specially trained auxiliary personnel may be observed and evaluated by the profession. The personnel could receive a carefully worked out course of instruction, over a period of two years, at a recognized institution. Authorities in the field of pediodontics, dental education, and public health would advise and assist in the planning of the research project and the evaluation of results. It is to be hoped that some state will show a willingness to suspend its licensing law and be willing to sponsor the study. I believe funds could be made available.

Millberry, in October, 1938, at a joint session of the Child Hygiene and Public Health Education Sections of this Association presented a paper entitled "Possibilities and Means of Improving Dental Conditions in the United States." He said, among other things, "Does it not seem possible to you that we should be able to train persons to do these simple operations for children in two years time?"

When Dean Millberry's paper was published in the *Journal*,[15] the following was a part of the editorial that appeared in the same issue:

> There can be no doubt that the cost of dental treatment is high and that the funds for providing it on a community basis are all too small. Any relief, such as offered by Millberry, will seem welcome to public health

administrators, most of whom have little knowledge of the technical problems involved. Over against this group will be the mass of dentists who will probably prejudge this proposal on its departure from the *status quo* without inquiry into its possibilities. Without taking a stand for or against the Millberry plan, it at least seems proper to suggest its consideration by a group of dentists thoroughly familiar with the problems involved in giving dental care to American children. A critical evaluation of the New Zealand method seems desirable also, particularly with regard to its applicability to North America.

I am glad to report that now, after the passing of a decade since the appearance of the editorial quoted above, a committee of this association is actively engaged in studying this whole problem of securing more dental service for children and is planning steps to secure an experimental study of the use of the auxiliary operator with a two year course of education. These plans will require the support of all who are interested in medical care programs and particularly of those who wish to find a practical solution to the problem of providing adequate dental services for children.

REFERENCES

1. Medical Care in a National Health Program—An Official Statement of the American Public Health Association adopted October 4, 1944. *A.J.P.H.*, 34, 12:1252 (Dec.), 1944.

2. O'Rourke, John T. The Evolution of Health Service Auxiliary Groups. *J. Am. Dent. A.*, 32, Oct., 1945.

3. Horner, Harlan H. Dental Education and Dental Personnel. *J. Am. Dent. A.*, 33:872 (July), 1946.

4. Morrey, Lon W. Dental Personnel. *J. Am. Dent. A.*, 32:131 (Feb.), 1945.

5. *Ibid.*

6. Klein, Henry. Dentist-Time Required To Perform Dental Operations. *J. Am. Dent. A.*, 35, Aug., 1947.

7. Bauer, John C. Joint Conference on Dentistry for Children and the American Soc. of Dentistry for Children, Chicago, February 9, 1947.

8. Salzmann, J. A. Editorial. *New York J. Dent.*, XI, 9 (Nov.), 1945.

9. Walls, R. M. Dentistry in the Post-War World. Read before the American Dental Assistants Assoc., Cincinnati, Ohio, Oct. 11, 1943.

10. Walls, R. M. Professional Obligations and Opportunities. Read before the New York Academy of Dentistry, New York, N. Y., Jan. 11, 1945.

11. Jeserich, A. B. Changing Concepts of Operative Dentistry. *J. Penn. State Dental Society*, XV, 6 (Mar.), 1948.

12. Elam, Roy O. The Dental Hygienist. *Texas Dent. J.*, 65, Dec., 1947.

13. Clawson, M. Don. The Future of Dental Education. Read before the Atlanta Dental Society, October 20, 1948.

14. Gruebbel, Allen O. *Evaluation of Recommendations of the Conference on Dental Health for Virginia.* April 9, 1948.

15. Millberry, Guy S. Possibilities and Means of Improving Dental Conditions in the United States. *A.J.P.H.*, 29:321–325 (Apr.), 1939. The Oral Health Group. Editorial, Apr., 1939, p. 375.

Vol. 39

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 39 April, 1949 Number 4

Editorial Board

REGINALD M. ATWATER, M.D.
Chairman, and Managing Editor

LEONARD GREENBURG, M.D.
PROFESSOR JOHN M. HENDERSON
RALPH S. MUCKENFUSS, M.D.
STUART MUDD, M.D.
RAYMOND S. PATTERSON, PH.D.
GEORGE ROSEN, M.D.
C.-E. A. WINSLOW, DR.P.H.

C.-E. A. WINSLOW, DR.P.H., *Editor*
AUGUSTA JAY, *Editorial Associate*

THE HEALTH EDUCATOR'S BOOKSHELF

OUR spring issue, a year ago, carried a stimulating Review Article on the Health Officer's Bookshelf. The health officer is, of course, the star of our show, but he is not the only one who must read books. There are a dozen other kinds of specialists on his staff, who need a dozen kinds of highly specialized knowledges. How can they get those knowledges and keep them unless they read the classics in our field--and the latest books as well?

This train of thought led the collective Editorial mind to the thought of expanding the Baedeker of Health which Dr. Huntington Williams began to explore so fruitfully last year. And the Health Educator seemed a logical next step. He (or more often she) must know something about everything in the entire field of health. The old saw tells us that the cultured man should know something about everything—but also everything about something. The Health Educator needs a wide vision of the whole field; but he must have also a deep and solid grasp of his own specialty, which is the imparting of knowledge and—in still greater degree—that impulsion of the spirit which creates the desire to use the knowledge gained. This is no easy task; and it is no surprise to find that while Dr. Williams recommended 79 books to the Health Officer, Dr. George Rosen—in the admirable review with which this JOURNAL opens—lists 118 volumes for the Health Educator. No wonder, this gifted type of specialist coördinates and integrates and educates and animates.

If our readers find the Bookshelves profitable, perhaps the other eleven sections may have their turn in the years to come.

HOUSING AND THE HEALTH OFFICER

THE general program of our Association Committee on the Hygiene of Housing was reviewed in the columns of this JOURNAL two years ago.[1] This committee was established in 1937 as the corresponding organ of the Housing Commission of the League of Nations for this continent. In 1938, it published its first report on the *Basic Principles of Healthful Housing*[2]; and, in 1941, a volume

on *Housing for Health* presented the results of a special conference called by the Milbank Memorial Fund.[3] During the past decade, the committee has developed—and has very recently completed—a technique for the realistic appraisal of housing quality.[4] This procedure makes it possible for the average sanitary inspector, after a few weeks of training, to evaluate the quality of the home and its environment with reproducible accuracy and to assign to each dwelling a penalty score expressing its significant health hazards in quantitative terms. The appraisal method, as M. A. Pond points out in this issue of the JOURNAL, contains 12 clearly defined "Basic Deficiencies" on any one of which the health officer can base legal proceedings. Even more important, however, is the fact that plotting the total penalty score (based on sampling surveys) on a city map gives a realistic picture of the character of individual blocks and larger areas which furnishes the soundest basis for future planning and for the adaptation of correctional measures or redevelopment to a given locality. Through the use of this procedure, the health officer can really "know his city" accurately. The gradual replacement of sporadic action following haphazard complaints by a comprehensive planned program will work a revolution in housing control. This revolution has already taken place in many American cities, as pointed out by Emil Tiboni on a preceding page of this JOURNAL. Such communities as Battle Creek, Mich., Brookline, Mass., Los Angeles, Calif., Milwaukee, Wis., New Haven, Conn., Panama City, C. Z., Philadelphia, Pa., Portland, Me., St. Louis, Mo., and Washington, D. C., have employed the appraisal method with significant results.

Sponsorship for this appraisal procedure has now been taken over by the U. S. Public Health Service, which is in position to offer counsel to any health officer who desires to employ it and to provide training facilities for the sanitarians who are to carry out the work. We confidently look forward to the time when all alert city and state health departments will include systematic housing evaluation in their program, as they include restaurant sanitation and milk control today.

During the past two years, the Committee on the Hygiene of Housing has been seriously handicapped by limitation of financial support and loss of some of the key members of its staff. The Milbank Memorial Fund has, however, recognized the vital nature of the problems involved and continued its loyal support. The staff has been reorganized and committee members are ready to devote liberally of their own time to work along two major lines.

The committee has planned, first of all, to complement its completed work on the definition of substandard housing by the preparation of a series of reports on the principles which should govern the construction of the healthful housing for which we hope in the future. The first volume, on *Planning the Neighborhood*[5] has already been published and is discussed by F. J. Adams in his contribution to our Boston Symposium. The committee is now at work on two subsequent volumes on "Planning the Home for Occupancy" and on "Construction and Equipment of the Home." It hopes to complete the report on "Planning the Home" within the present year. Standards for this purpose are most urgently needed, since not only speculative builders but government agencies are today advocating homes so narrowly constricted in space as to constitute a serious threat to health and amenity. Space is one of the most valuable things which the home builder has to sell; and in ten or twenty years we may be seriously embarrassed in dealing with "the slums of 1948 and 1949."

A second major project of the committee is the formulation of a report on the substantive content of a model housing code, under the leadership of E. R. Krumbiegel. The problems of building codes to govern new construction are also serious; and the committee is convinced that reform in this area must be effected by substituting broad performance standards for the minute structural provisions now in force, which are out-of-date a few months after such a code is adopted. The housing code for occupied dwellings, has, however, been the major concern of the committee. Such a code, in its judgment, should be enforced primarily by the health department as the one agency which possesses the necessary technical knowledge and has a force of inspectors constantly visiting the homes of the community. It is hoped that the report of the committee on this subject will give the health officer a model on which can be based a sound section on housing for his local sanitary code.

We believe that the program of the Committee on the Hygiene of Housing illustrates a significant trend in the whole field of sanitation, toward the goal of positive promotion of health and not merely the negative prevention of disease. The water supply engineer is interested in addition of fluorine as well as in elimination of typhoid germs; the industrial engineer in thermal air-conditioning, as well as in control of lead fumes. As Catherine Bauer has said in her contribution to the Boston Symposium, "Sanitary measures were undertaken to curb the fearful epidemics of filth-bred disease. Then gradually it became clear that not only the absence of dirt but the presence of sun, air, and adequate space are essential to the prevention of disease. And finally the whole emphasis changed from a remedial approach to more positive and constructive goals."

REFERENCES

1. Winslow, C.-E. A. Health Goals for Housing. *A.J.P.H.*, 37:653 (June), 1947.
2. *Basic Principles of Healthful Housing.* New York: A.P.H.A. 2nd ed. May, 1939. Reprinting, 1946.
3. *Housing for Health.* Lancaster, Pa.: Science Press, 1946.
4. *An Appraisal Method for Measuring the Quality of Housing.* New York: A.P.H.A.
   Part. I. *Nature and Uses of the Method,* 1945.
   Part. II. *Appraisal of Dwelling Conditions,* 1946.
   Part. III. *Appraisal of Neighborhood Environment,* 1949.
5. *Standards for Healthful Housing. Planning the Neighborhood.* Chicago: Public Administration Service, 1948.

FACING THE FACTS OF LIFE

THE Administration Bill, "to provide a national health insurance and public health program" (S 5 and H R 783) has been introduced in Congress. Its provisions—and its ultimate fate—will be of keen interest to all of us during the coming months.

Title I (a general Declaration of Purpose) need not concern us, since it is merely a statement of broad principles, to which almost everyone must agree. Title III, which deals with Development and Expansion of Health Services, provides for a continuation of federal grants such as the U. S. Public Health Service and the Children's Bureau have administered in the past. It is vitally important and some of its provisions may require consideration; but, in the main, it does not involve controversial issues.

Title II on Prepaid Personal Health Service Benefits, on the other hand, will be the central issue in a real battle. It creates a national system of health insurance covering employed (including self-employed) persons with certain family dependents of the insured. It is proposed that the plan be financed by a contribu-

tion equal to 3 per cent of all wages or net incomes up to $3,600 a year, with additional allocations from general tax funds. This measure obviously involves profound modification of our past social policy with respect to medical care. Its details will call for most careful analysis. We must consider whether the "tooling-up period" before the program would come into operation (in 1952) is adequate. We must be certain that the decentralization of the program to the state and local levels is as complete as appears at first glance. How will local areas be delimited and administered? What local advisory committees should be provided for representation of the professions and the public? How should a local medical care program be related to the jurisdictions of local health departments? Such details of administration and operation will require the most careful scrutiny, to avoid complications which have occurred in the introduction of the present British program. We must decide whether—and what—upper limits of income might be set for those receiving service. We must consider in what order of sequence particular services (hospital, office visits, home care, nursing, dentistry, etc.) should be provided for the insured. This last point is left for future administrative decision in the present bill; but it will vitally affect all aspects of the program. Estimates of cost and details of financing will require careful scrutiny. In these highly technical matters, we must rely on the advice of competent experts in this field. There are probably not more than twenty such experts in the United States (of whom the Editor of this *Journal* is not one); but ultimate responsibility must rest on all of us—after hearing the experts and considering their findings with open-minded reasonableness.

It is most important that we—in the public health profession—should consider this measure with a sense of special responsibility, since we do have some expert knowledge of the problems involved and since the administrative conduct of many aspects of the program may be in our hands. It is basically important that we, at least, shall view the problem honestly and on factual grounds and not be led astray by propaganda based on false emotional appeals.

The basic need for some method of making the beneficent results of American medicine available to families in the low-income and moderate-income groups (the great middle class of our population) has been amply demonstrated since the Committee on the Costs of Medical Care made its first study 15 years ago. It has, again and again, been shown that the less fortunate groups, in spite of our clinics and hospitals, receive less than half the medical care they need. The existence of the problem cannot be challenged. How can it be solved?

There are several possible solutions which have been suggested. The first of these is State Medicine, the provision of medical care to all citizens by public hospitals and by physicians and other professional personnel employed by the State, as we now provide education by State-employed teachers. This is the program of the Soviet Union; but it has no appreciable supporters—as applied on a wholesale scale to medicine—in the United States or Canada.

A second plan, now backed by a vigorous and vocal group in the United States, is extension of voluntary insurance (of the Blue Cross and Blue Shield Types), supplemented at the bottom of the scale by public medical care for the recipients of public assistance. This is a tempting program; and it operates with effectiveness for a certain relatively high income group. There are at present probably 3 million (certainly not more than 5 million) persons in the whole country covered by plans of voluntary insurance with fairly comprehensive scope. All others now classed as "voluntarily insured" are covered only for very limited

services. Both logic and experience indicate that such a program does not—and cannot—reach the large middle group of the population.

Families with an income above a certain level can meet even the emergency costs of illness when they arrive because they have an ample cushion of reserves on which they can draw in an emergency; these families get good medical care today, with no outside assistance. They constitute, however, only a small proportion of the population.

A second group of families have an income sufficient to meet the average cost of medical care but not enough to meet the emergency costs of illness as they arise. This is the group which benefits by voluntary insurance.

A third group of families—and a very large one—have incomes which are not sufficient to lay aside enough each year to cover even the average cost of medical care. This group cannot by any possibility share the benefits of voluntary insurance plans because they cannot afford the dues. It is this major group which a system of social insurance, financed by contribution from both the beneficiaries and their employers, is designed to serve.

If our rejection of State Medicine is sound (as it certainly is); and if Voluntary Insurance cannot possibly serve those unable to "volunteer" the money which they do not possess; there would seem to be three possible courses to pursue.

We can decide to do nothing about the matter except to develop Voluntary Insurance for the relatively high income groups; but it is doubtful if this policy can be indefinitely pursued in a democratic society, to which we have been preaching that—in the words of the WHO Constitution—"The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."

Or, we can accept the broad principle of social insurance, supported jointly by both employer and employee, and strive to perfect the details of a program of this sort so as to make it most effective and most economical, and so that it will be conducive to the highest possible standards of quality of medical care.

Or, perhaps, someone can devise some better way of meeting the basic problem. An adequate and universally acceptable plan would be a major boon to the United States and Canada, both of which nations are facing the issue in the immediate future.

But the problem cannot be solved by an ostrich policy of sticking our heads in the sand. It cannot be solved by denying its existence. It cannot be solved by asking families to join in support of voluntary insurance and pay out money which they do not possess.

It can only be solved by facing the basic economic realities of life.

THE PROBLEM OF HEART DISEASE

PRIORITY decisions in public health policy must be based on a balance between the magnitude of a given menace to health and the efficacy of available methods of meeting that menace. If a certain disease kills ten people a year in the community and we know how to control it, that disease takes priority over another which kills a hundred people but is not susceptible to demonstrated methods of prevention. From the standpoint of magnitude, diseases of the heart and blood vessels clearly constitute our Number One health problem,

since these diseases cause three times as many deaths as cancer, six times as many as accidents, seven times as many as kidney diseases, nine times as many as pneumonia and ten times as many as tuberculosis. From the standpoint of preventability, of course, diseases of the heart and blood vessels rank low in priority; but there are clear indications that this may not always be the case.

In an admirable recent article,[1] Dr. H. M. Marvin, President-Elect of the American Heart Association reminds us that at least five different diseases are grouped under the major heading "diseases of the heart and blood vessels." These are: the conditions grouped under "congenital malformations of the heart"; syphilitic heart disease; rheumatic heart disease; arteriosclerotic heart disease; and hypertensive heart disease, related to high blood pressure. Congenital heart disease is, of course, a relatively small factor of the total problem and syphilitic heart disease is decreasing measurably. It is the last three types which present our major problem.

There are, in general, three major approaches to the control of disease—anti-microbial, nutritional, and therapeutic. All three of these approaches offer definite promise in dealing with one or another form of heart disease. We are as yet in the dark as to the relation of streptococci to rheumatic fever, but it is highly probable that such a relationship exists. Epidemiological control of streptococcosis is a promising avenue here and the use of sulfa drugs after an initial attack of rheumatic fever, the use of penicillin before and after extraction of teeth and operations about the nose and throat and the treatment of bacterial endocarditis by penicillin have yielded encouraging results.

From the approach of the nutritionist and biochemist comes evidence suggesting that obesity and a high blood content of cholesterol are associated with coronary disease and that a saltless diet may be of material value in checking the development of arteriosclerosis.

In the field of therapeutics, treatment of victims of coronary thrombosis with dicumarol has yielded highly encouraging results and several serious malformations of the heart in children may be corrected by surgery.

These are only glimpses of small sections of the problems involved. Dr. Marvin is correct when he tells us "that if this country is to make any significant advance in conquering its leading cause of death, it must be in the first place through wide, intensive, prolonged research by competent investigators who can devote all their time and energies to the task." Hope for the future lies in the program of the National Heart Institute at Bethesda, in the stimulative efforts of the American Heart Association and the studies under way in our universities, particularly the basic work of Ancel Keys on the physiology of the aging process at the School of Public Health in Minneapolis. From the research laboratory must come the knowledge which will bring the controlability of heart disease on a par with its magnitude as a cause of death. If such investigations are adequately supported, a decade—or two decades—of research should make diseases of the heart and arteries a major practical objective for the health officer.

REFERENCE

1. *Yale Rev.*, 38:283 (Winter), 1949.

Clearing House on Public Health Salary Information and Personnel Needs

Salaries Are Not the Whole of Recruitment

It is obvious that salaries are not an isolated phenomenon but rather one element in the larger problems of recruitment and personnel needs. It is logical, therefore, that the Clearing House should deal with the other facets of these problems. In this issue therefore, a first step has been taken toward broadening its coverage. It contains some items of significance to recruitment which do not primarily deal with salaries.

The further success of the Clearing House depends on the continued coöperation of the readers of the *Journal*. As has been the case heretofore, contributions dealing with salaries and also significant items dealing with personnel needs and recruitment are invited.

California does something about recruitment

To stimulate recruitment for public health vacancies in California, the California State Health Department has published an appealing 16 page pamphlet entitled: "Thinking about Your Future? What About a Career in Public Health?" It contains a brief summary of the agencies and branches of activity in public health work and devotes individual sections respectively to the jobs of health officer, public health nurse, public health engineer, sanitarian, health educator, public health analyst, and laboratory technician. In each section the activities characteristic of the particular job are described and illustrated by examples and attractive drawings. Salary ranges, training requirements, and the general professional outlook are included. The text is well written and carefully avoids "lingo." The pamphlet is equally suitable for high school students and for those with more advanced education.

A total of 25,000 copies of the pamphlet have already been printed. They are being distributed through the State Department of Education to vocational counselors in high schools, colleges and universities in the state. It is expected that this will be followed by many requests for copies for student distribution which will be handled by the local health departments.

The California State Health Department is unable to send quantities of the pamphlet outside the state. One state has already been granted permission to reprint the pamphlet with a credit line to the California department.

In addition to "Thinking about Your Future," a recruitment pamphlet on physicians in public health is in preparation, planned jointly by the State Personnel Board and the State Health Department. The Health Department is also distributing two one page (quarterly) bulletins containing information on vacancies in public health medical positions, scholarships, and postgraduate public health training, to medical schools and to hospitals in the state approved for intern and residency training.

All in all it looks like an energetic and promising beginning in reducing the personnel shortage in public health positions in California. Yet, California

is not as badly off in this respect as many other states. If these states also would devise and carry out recruitment programs tailored to their individual needs, the shortage of personnel, several years hence, might be less severe than it is now.

DEFENSE SECRETARY CAMPAIGNS FOR MEDICAL PERSONNEL

As of February 15, former U. S. Defense Secretary James Forrestal began a national campaign seeking physician and dentist volunteers for the armed forces. This campaign was proposed by the armed forces Medical Advisory Committee. A campaign committee is made up of the three Surgeons General of the Army, Navy, and Air Force, and serves as a liaison with the American Medical Association, American Dental Association, and other interested professional and non-professional groups.

This campaign for volunteers is said to be preliminary to compulsory induction of such medical and dental personnel. It is based on the fact that there is a pool of 8,000 young men who received their training in whole or in part at government expense and who did not serve in the armed forces, and a further pool of 7,000 who were deferred to continue their training at their own expense

From these two groups it is hoped to recruit as volunteers 2,200 physicians and 1,400 dentists to meet expected shortages by December, 1949.

Physicians and dentists are asked to volunteer for a minimum of one year. They would receive $100 a month in addition to prescribed pay and allowances for their rank.

Concurrently with the campaign for volunteers, the Advisory Committee has promised a careful and continuing review of the work load of the medical and dental services and of the utilization of professional personnel to determine where economies can be made.

Obviously this campaign or the compulsory inductions that may follow if it fails to meet its goal, will further reduce medical and dental personnel available for public health agencies. It underlines further the necessity of stepping up recruitment and training programs, of bringing salaries into line, and of a "careful and continuing review of the work load and of the utilization of professional personnel." Perhaps, translated into grass roots terms, that might mean no longer should a medical officer of health carry on for a population of 20,000 a multitude of activities, many of which could well be done by less scarce personnel, leaving him free to give his expert services to 3, 4, or 5 times that population.

HEALTH EDUCATION SECTION SALARY RECOMMENDATIONS

Recommended standards for health educators' salaries have been in progress of development during the past year. At the American Public Health Association's Annual Meeting in Atlantic City in 1947, the Committee on Health Education Planning of the Health Education Section created a subcommittee on salaries for health educational personnel. Its Chairman is Alfred K. George, M.D., of the Department of Preventive Medicine of the University of Cincinnati School of Medicine.

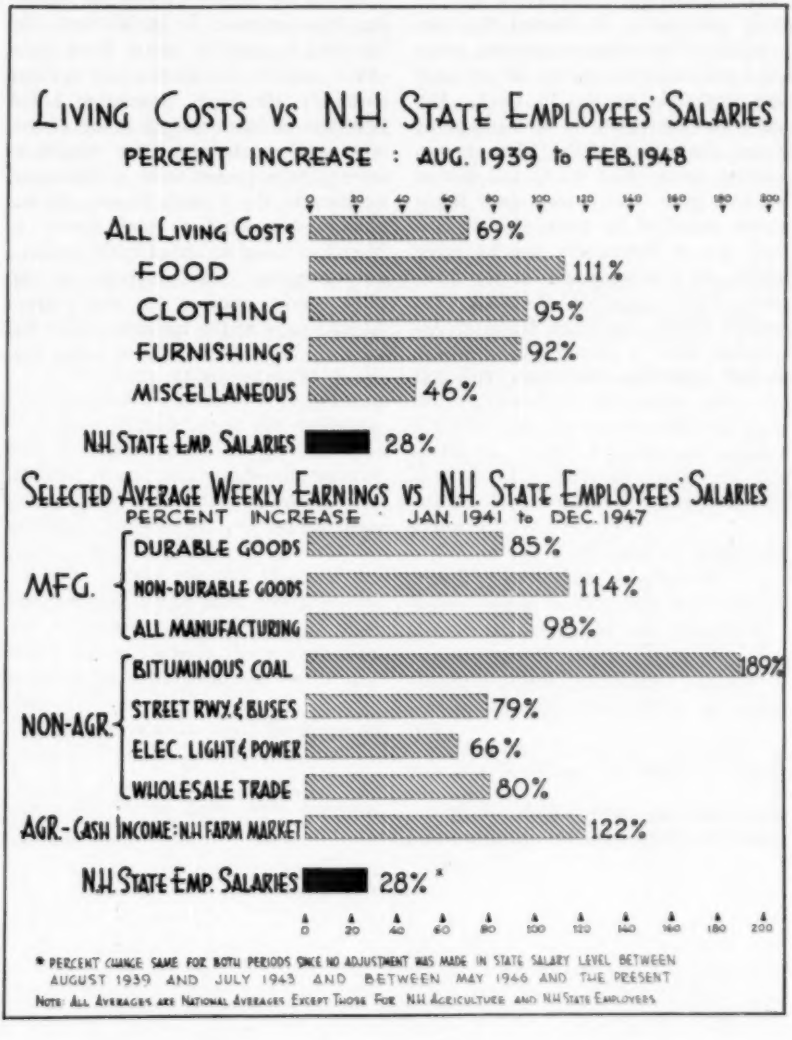
This subcommittee's report, Proposed Levels of Recommended Starting Salaries for Six Grades of Positions for Community Health Educators, was unanimously accepted by the parent committee on Planning for Health Education, in November during the American Public Health Association's Annual Meeting in Boston.

In addition to background information, particularly the varied factors that enter into the determination of appropriate salaries in any specific time or place, the report describes the six grades of positions in terms both of job descriptions and recommended qualifications.

The study is available in mimeograph form for limited distribution from Dr. Alfred K. George, University of Cincinnati College of Medicine, Cincinnati, Ohio.

NEW HAMPSHIRE EMPLOYEES' SALARY BRIEF

The State Employees' Association of New Hampshire has made an interesting approach to the problem of increased salaries for state workers. It prepared a brief for presentation to the General Court which alone has the power to grant increases. Its brief took the form of comparisons between the percentage rise in salaries of New Hampshire employees for the period 1939–1948 and two other factors: the percentage rise in cost of living and the percentage rise


LIVING COSTS VS N.H. STATE EMPLOYEES' SALARIES
PERCENT INCREASE : AUG. 1939 to FEB. 1948
0 20 40 60 80 100 120 140 160 180 200
ALL LIVING COSTS 69%
FOOD 111%
CLOTHING 95%
FURNISHINGS 92%
MISCELLANEOUS 46%
N.H. STATE EMP. SALARIES 28%
SELECTED AVERAGE WEEKLY EARNINGS VS N.H. STATE EMPLOYEES' SALARIES
PERCENT INCREASE · JAN. 1941 to DEC. 1947
MFG.
DURABLE GOODS 85%
NON-DURABLE GOODS 114%
ALL MANUFACTURING 98%
NON-AGR.
BITUMINOUS COAL 189%
STREET RWY. & BUSES 79%
ELEC. LIGHT & POWER 66%
WHOLESALE TRADE 80%
AGR.-CASH INCOME: N.H FARM MARKET 122%
N.H. STATE EMP. SALARIES 28% *
0 20 40 60 80 100 120 140 160 180 200
* PERCENT CHANGE SAME FOR BOTH PERIODS SINCE NO ADJUSTMENT WAS MADE IN STATE SALARY LEVEL BETWEEN AUGUST 1939 AND JULY 1943 AND BETWEEN MAY 1946 AND THE PRESENT
NOTE: ALL AVERAGES ARE NATIONAL AVERAGES EXCEPT THOSE FOR N.H. AGRICULTURE AND N.H. STATE EMPLOYERS

in weekly earnings and of farm income for a somewhat shorter period. One of the charts accompanying the brief is reproduced here. Such a chart might well be adapted for use by public health workers who need to dramatize their salaries in relation to the cost of living.

HOSPITAL SALARIES AND WORKING HOURS

The 4th annual salary survey of the American Hospital Association was recently published. It showed that the typical hospital employee worked fewer hours and received nearly 10 per cent more pay than he did in 1947. His salary had increased by an average of 28 per cent since 1945. The survey, covering more than 4,600 non-federal hospitals gives salary and other information classified by state, size of hospital, size of community, among other details. It is summarized in the February, 1949, issue of *Hospitals*, the Journal of the American Hospital Association, and is presumably available in full from the American Hospital Association, 18 E. Division St., Chicago 10.

SOCIAL WORK EMPLOYMENT CONDITIONS

Social workers, along with teachers and public health workers, have been traditionally in the depressed salary level group. They too are concerning themselves with the salaries and working conditions of their profession.

Under the sponsorship of the American Association of Social Workers, the National Council of Social Work Education, and the National Social Welfare Assembly, the U. S. Bureau of Labor Statistics is conducting a study of salaries and related working conditions among the approximately 50,000 social workers in the United States. It has already completed a pilot survey in Michigan based on about 2,000 returned questionnaires. An analysis of this pilot study appears in the current (April) issue of the monthly *Labor Review* of the U. S. Bureau of Labor Statistics, Washington, D. C.

A NEW STEP IN THE ACCREDITATION PROGRAM

The Executive Board on January 28, 1949, approved the recommendations of the Committee on Professional Education to accredit institutions for Master's degrees other than the M.P.H. (M.A., M.S., M.S.P.H., M.Ed., etc.) with specialization in the field of public health education. This accreditation will be limited to institutions with schools of public health already accredited for the M.P.H. degree. The schools of public health will be in a position to utilize the teaching facilities of closely collaborating university departments and to grant admission to students interested in a career in health education who do not meet the admission requirements for the M.P.H. course but appear otherwise qualified. Below are printed the Criteria for the accreditation of Master's degrees in public health education other than the M.P.H.

It is believed that this step will enable most of the schools of public health to increase materially the number of those students who wish to prepare themselves for a career in public health education. It is hoped that this may be one step in the direction of relieving the shortage of trained community health educators.

Criteria for Institutions To Be Accredited for Master's Degrees other than the M.P.H. (M.A., M.S., M.S.P.H., M.Ed., etc.), with Specialization in the Field of Public Health Education, for the Academic Year 1949–1950 *

1. Candidates admitted for the degree must hold a Bachelor's degree and must have completed at the collegiate level or must include as part of their graduate year, basic academic training in the fields of chemistry, biology, bacteriology, physiology, sociology, psychology, and education.

2. The course for the Master's degree must occupy at least one academic year of which at least half time must be devoted to study in the subject matter areas listed in paragraph 4a, b, and c below.

3. The curriculum must be given in a school of public health accredited by the American Public Health Association or in such collaboration with such a school that the requirements of paragraph 4a, b, and c below are satisfied through utilization of courses in said school or acceptable for credit in said school.

4. The following areas of knowledge should be covered in the graduate course unless credits for previous work acceptable to the institution are presented:

a. Physiological and psychological hygiene (including nutrition and mental hygiene)

b. Microbiology, epidemiology, and sanitation

c. Community health and community organization (including both official and voluntary agencies)

d. Health education (including both public health education and school health education)

* Adopted by the Committee on Professional Education of the American Public Health Association, December 8, 1948; approved by the Executive Board, January 28, 1949.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Essentials of Public Health—*By William P. Shepard, with the Collaboration of Charles Edward Smith, Rodney Rau Beard, and Leon Benedict Reynolds. Philadelphia: Lippincott,* 1948. xviii plus 600 pp. plus 29 charts, plus 19 illus. Price, $5.00.

This volume is unique in the current literature of public health. Dr. Shepard, with the assistance of three colleagues who have contributed important chapters, has set out to present public health, rather than preventive medicine, to medical students and practising physicians. He has attempted to point out the responsibility of the physician and his relationship to the community program.

After an opening chapter which defines the problem of public health and describes the various participating agencies, there follows a series of sections dealing with the modern public health program. Professor L. B. Reynolds and Dr. C. E. Smith contribute an excellent section on environmental sanitation. The discussions of various processes are adequate for the medical practitioner, though far less detailed than is commonly found in many texts. A section on communicable diseases by Dr. Smith is written in quite general terms, leaving the detail for two highly valuable and comprehensive tables. Dr. Shepard discusses tuberculosis, venereal diseases, maternal and child health, school health, adult health, health education and industrial hygiene. Dr. Beard contributes an additional section on occupational health and on statistics.

This is not a text of preventive medicine or of epidemiology. On the contrary, the authors have quite generally assumed that the reader is already familiar with medical details of preventive procedures and have limited their discussions to the aims and operations of community programs. At times they may even have assumed too great a familiarity. Throughout the volume they have stressed the relationship between the physician in private practice and the various agencies participating in the community program, and have pointed out the division of responsibility as well as the basis for coöperation.

Dr. Shepard and his colleagues have succeeded admirably in their chosen task but in doing so have produced a volume of equal if not greater interest to the public health administrator. The latter can read it with real profit to learn his relationship with practising physicians. The book will find its greatest usefulness for health officers and physicians already in practice and for medical students who are reaching the end of their formal schooling. If a book of this character could be read and taken to heart by all practitioners and health officers as they embark upon their respective careers, much of the misunderstanding that now exists could be avoided. GAYLORD W. ANDERSON

Advances in Biological and Medical Physics, Vol. I—*Edited by John H. Lawrence and Joseph G. Hamilton. New York: Academic Press, Inc.,* 1948. 484 pp., illus. Price, $8.60.

Scientists in many categories will find this book useful; to an increasing number it will be indispensable. It is the first issue of a projected annual review: "Each volume will contain from eight to twelve articles surveying the recent progress in radiation research, radiochemistry and tracer methods as applied

to biology and medicine." Though packed with detailed data, the editors found it necessary to omit many important topics for lack of space. Ten chapters by thirteen specialists review "fundamentals of radioactivity, instrumentation, techniques of application and radiation protection."

The opening chapter, by Dr. Lawrence and Dr. Ellsworth C. Dougherty, of the Division of Medical Physics, University of California at Berkeley, summarizes recent work with heavy and radioactive isotopes in clinical and experimental medicine. This is one of three chapters that will be of particular interest to physicians in practice, health officers, industrial physicians, those engaged in certain phases of medical research, and to some industrial engineers. A suggestive part of this chapter is a table of 6 pages listing the important stable and radioactive isotopes that have so far found application in medical research.

Second of these three chapters is by Dr. H. M. Parker on radiation protection and that new area which has been designated as "Health-physics . . . a product of the war-time organization within the Plutonium Project." Dr. Parker defines it as "a borderline subject surrounded by Industrial Medicine, Radiobiology, Industrial Safety, Public Health, Physics, Engineering and Chemistry"! Everyone whose work may expose him to even minimal amounts of radiation could read this chapter with profit to his own and others' safety; likewise health officers, radiologists, industrial physicians, and engineers who are responsible for the safety of exposed personnel.

While much has already been published concerning the effects of the atomic bomb on the Japanese, the chapter by Drs. Joe W. Howland and Stafford L. Warren reviews these facts critically and adds interesting observations made one year later. The latter provide little confirmation of fears as to long-range effects. Possibly the time is still too short.

Material in the seven remaining chapters is of a highly technical nature, often involving extensive mathematical treatment characteristic of nuclear physics. It includes a summary of the nature and production of artificial radioactivity and its measurement, and details of research into fundamental physiology. If one who is untrained in these complexities has the patience to peer beneath the technicalities, he will discover the most exciting news in the world of science. Here man has the tools with which to explore those problems of living matter that have so far baffled his ingenuity, such as certain basic aspects of the metabolism of proteins, carbohydrates, fats, iron and hemoglobin, phospholipids, and nucleic acid derivatives; virus reproduction; antigen-antibody relationships; photosynthesis, etc. Work in each of these fields is reviewed in detail or briefly mentioned. Yet only a beginning has been made. We may say with Prof. A. N. Whitehead: "The whole of human practical activity is in the process of immediate transformation by novelties of organized knowledge."

Format of the book is excellent. Each chapter begins with an outline of its contents and is followed by a bibliography of from 25 to 200 titles. There is an author index of 11 pages and a detailed subject index covering 17 more. An abundance of tables, charts, and formulae will be of practical aid to the specialist. GEORGE S. LUCKETT

Some British Pioneers of Social Medicine—*By Major Greenwood. New York: Oxford University Press*, 1948, 118 pp. Price, $4.00.

Social concern about health is of considerable antiquity. Only rarely, however, were the social relations of health made the subject of theoretical discussion. An instance that proves the rule

is the work of Ibu Khaldūn (1332–1406), North African historian and philosopher, who advanced a number of correlations between such factors as urbanization, diet, occupation, and mode of life, and the health of a population. It was during the 18th century that the need for consideration of social viewpoints in dealing with problems of medicine and hygiene was clearly recognized by medical men. It was left for the 19th century, however, to develop the idea of medicine as a social science and eventually to formulate a concept of social medicine.

In his book, which embodies the Heath Clark Lectures, University of London, delivered in 1946, Major Greenwood deals with certain aspects of this development in Britain. Admitting that he is more interested in social statistics than in administration or legislation, the author focuses attention chiefly on the contributions of certain British pioneers of social medicine who were interested in discovering by means of statistics the facts concerning the health of the society in which they lived. Greenwood traces the development of this line of thought in a series of selected biographical sketches from the 18th century to the close of the 19th century.

After appraising the work of John Graunt, William Petty, and Thomas Short, he discusses the activities of Thomas Percival and John Ferriar in Manchester. Separate chapters are then devoted to Edwin Chadwick, William Farr, John Simon, and the last chapter deals with Florence Nightingale and Francis Galton. Those familiar with Greenwood's other writings will know that these essays by a wise man, who has a great liking for "men who loved doing little sums," are written in delightful English. Of the two appendices, that entitled "The Epidemiological Future" is a must for every epidemiologist and health officer. It is unfortunate that the price of $4.00 should be set for this small book, as it is one that teachers might otherwise well urge students to buy. GEORGE ROSEN

Your Diet for Longer Life—*By James A. Tobey. New York: Wilfred Funk,* 1948. 280 pp. Price, $3.50.

"Good nutrition makes life worth living" is, in the author's phraseology, the theme of this handy reference book by a well known authority on health, in language addressed to the intelligent layman who is seeking help to maintain his vigor and vitality in later years. The scientific basis for good nutrition is simply and clearly explained.

The author's special emphasis on weight control through diet is in line with the best medical opinion that obesity predisposes to many of the chronic ills of middle and later years. Special dietary advice is given for several other abnormal conditions, as well as for the expectant and nursing mother. The author supports each recommendation with accepted scientific facts. The only criticism might be that he is more technical on certain subjects than others, and than is necessary to make his point. In a few instances he seems too ready to accept data not fully substantiated by other workers. The questions at the end of the chapters are not particularly stimulating and, in some instances, are rather vague.

In general, this little book is readable, scientifically sound, and a convincing exposition of the importance of good nutrition for a longer and fuller life.

HELEN S. MITCHELL

Introduction to Health Education—*By Jackson R. Sharman. New York: Barnes,* 1948. 273 pp. Price, $3.00.

"If teachers are to assume the important responsibility of educating all boys and girls in healthful ways of living, their preparation must cover at least the minimum essentials of health education. This book was prepared for use

in courses on health education for the general classroom teacher who can complete only one or two courses in the philosophy, subject matter, and methods of health education."

This book does meet the objectives set by the author. The philosophy which underlies the discussion throughout is in keeping with current thinking regarding the school health program.

Three broad areas are covered by the eleven chapters: background; school environment, health education curriculum, and principles of method in health education; and basic subject matter in health education.

The questions at the end of each chapter are provocative and should be of considerable assistance to the students. The references which follow each chapter are up-to-date and are culled from a wide field.

The paper, type size, printing, and format are in good taste and make for easy reading.

There are a few minor errors of fact, but on the whole the material is scientifically accurate.

Instructors of health education in the teachers colleges and schools of education will find this textbook of assistance in their introductory courses in health education. S. S. LIFSON

New Techniques of Happiness—*By Albert Edward Wiggam. New York: Wilfred Funk, Inc.*, 1948. 352 pp. Price, $3.75.

If we accept the meaning of health defined by the recent National Health Assembly as being "a state of complete physical, mental and social well-being," the above book is within the scope of public health. It is not concerned with abstract philosophy but is a digest of recent experiments and studies by outstanding psychologists concerned with finding more adequate social techniques. Dr. Wiggam, a distinguished science reporter, translates the findings of these scientists, comments on them, and points the way for the reader to use such findings in order to obtain greater happiness and contentment of mind. It is in this interpretation that the author himself gives a generous sprinkling of his own wholesome philosophy.

Some outstanding chapters are: How To Conquer Fear and Worry, How To Manage Your Emotions, and How To Get along with People. The studies on relaxation made in the Laboratory of Clinical Physiology, University of Chicago, are reported in some detail. The chapter, A New Way To Cure Bad Habits is so challenging that the reader may be tempted to try this new method of "negative practice."

While this book makes no attempt to approach the study of human conduct through psychiatry, it is nevertheless a readable digest of practical, applied psychology for both professional and lay readers. JEAN V. LATIMER

American Standard Practice for School Lighting—*New York: The Illuminating Engineering Society*, 1948. 77 pp., 45 illus. Price, 1 to 4 copies, 50¢ ea.; next 20 copies, 25¢ ea.; all over 24 copies, 15¢ ea.

The *American Standard Practice for School Lighting* is published under the auspices of the American Standards Association with the Illuminating Engineering Society and the American Institute of Architects serving as co-sponsors. It encompasses and provides specific recommendations for the many features of a classroom which constitute the visual environment for the students. For the first time in a publication of this type, specifications as to maximum fixture brightness and limiting brightness ratios, in addition to foot candle tables, are set forth to assure comfortable and easy seeing conditions in the classroom. Recommended reflectance values for desks, floors, wall, and ceiling are given which, with a good distribution of light,

will assure properly balanced brightnesses between these areas in the classroom. Illumination results to be expected from a considerable number of lighting installations, employing both incandescent and fluorescent sources, are indicated. The control and use of natural lighting is discussed. The relative merits of various fenestration techniques and daylight controls, including directional glass blocks and diffusing screens, are also set forth. The importance of adequate wiring for today's and tomorrow's needs are stressed in an Appendix, and the proper wire sizes are suggested for typical conditions to serve as a guide for the school architects.

The report is generously illustrated with photographs and charts. An extensive bibliography is also included. It should be of particular value to school administrators, building superintendents, members of environmental divisions of public health staffs, and school architects.

FRANCIS B. ELDER

Handbook of Practical Bacteriology—*By I. J. Mackie and J. E. McCartney (8th ed.). Baltimore: Williams & Wilkins,* 1948. 624 pp. Price, $7.00.

This handbook by English authors is a well bound book on a fair grade of paper. The contents of the book extends from "Practical Bacteriology" to include, as indicated in the opening line of the first chapter, Bacteriology or Microbiology, which are obviously not synonymous.

In reading this very good book, one is impressed once again with the need of uniformity in terminology on a global basis; to mention only one example, such as "Bacillus" which is recognized by the authors on page 12.

It seems to the reviewer that bacteriology is definitely one field, viruses another, pathogenic fungi another, protozoa another—thus seven pages devoted to pathogenic fungi seems an injustice, even though the authors refer to other texts for detailed information. For a text on practical bacteriology, *per se*, future revisions might well follow expansion on the practical side and minimize the general textbook consideration.

Among many worth while features of this text, the reviewer directs attention to the chapter on microscopy as an excellent one. The fine chapter on culture media is an extensive and varied one, including such media as Lowenstein-Jensen Medium for cultivation of *Mycobacterium tuberculosis*. This particular medium is currently receiving deserved special emphasis at the United States Public Health Service Tuberculosis Evaluation Laboratory under Dr. Martin Cummings.

The text can be recommended for use as the authors indicate to those who have used its predecessors and further to those interested in a viewpoint, expression and approach somewhat different from that currently found in most texts by American authors.

F. C. LAWLER

American Nurses Association Public Relations Workshop—*A Manual of Practical Public Relations Techniques for the Guidance of the National Membership of the American Nurses Association. New York: American Nurses' Association,* 1948. 32 pp., 39 illus. Price, $2.50.

As indicated by the title, this manual was prepared for the membership of the A.N.A. and particularly for the chairman of Public Relations Committees of the state and district nurses' associations. Anyone, nurse or non-nurse, who is not familiar with how to use publicity media will find this manual helpful. It was prepared by Edward L. Bernays, Counsel for Public Relations for the A.N.A. He defines public relations and then explains its techniques in a very understandable way. Charts and photo-

graphs are used to illustrate his points and make the manual very easy reading.

The public health agency that does not have a trained, experienced public relations member of its staff might well buy a copy of this manual as an aid to those who are responsible for interpreting its work to the public. It tells how to approach newspaper editors, radio and television station program chairmen, and movie managers, and the kind of information that will interest them. The last chapter, Your Community Blueprint, should be particularly helpful to the young public health worker as it summarizes community groupings and suggests how to use them for interpretation purposes.

EMILIE G. SARGENT

Danger! Curves Ahead — *By Miriam Lincoln. New York: Macmillan,* 1948. 138 pp. Price, $2.50.

"This little volume on obesity has been prepared as an aid to those courageous souls who, realizing that they are overweight, have determined to do something about it but need guidance on procedure." This statement by the author in her introduction is really the theme of the book.

Obesity, its causes, dangers, and best methods of correction are discussed in a simple and interesting style. The reader is advised how to overcome some of the psychological handicaps of reducing successfully. Insight into the patient's emotional problems, anxieties, and frustrations is a specialty of the author in handling her patients.

The book is obviously addressed to overweight women and makes an appeal to pride in appearance, as well as to health. The nutritional advice given is sound but rather too brief for those with inquiring minds. The simple table of calorie values of foods and well planned reducing menus for different seasons of the year should be helpful. A unique feature is the list of low-calorie company menus for use when entertaining one's obese friends.

The reviewer does not hesitate to recommend this little volume to any woman without scientific background who is interested in maintaining, or re-establishing, her normal weight for her height and build.

HELEN S. MITCHELL

Emergency Maternity and Infant Care—A Study of Administrative Experience — *By Nathan Sinai and Odin W. Anderson. Ann Arbor: School of Public Health, University of Michigan. Bureau of Public Health Economics Research Series No. 3,* 1948. 181 pp.

This is the report of an administrative study of the Wartime Emergency Maternity and Infant Care Program. Being one of six national health plans which have been inaugurated in the United States during the past ten years, the authors regard EMIC as an "experimental laboratory," from which there are lessons to be learned. Most of the problems encountered in EMIC are inherent in any state or national health plan for the distribution of medical and hospital care, whether on a voluntary or compulsory basis.

In Part I, the authors tell the story of the hurried establishment and somewhat stormy career of EMIC. Many of the reasons for the confusions, tensions, and frustrations experienced by those intimately involved in the administration of the program and rendering services under its provisions, are analyzed. The scope of this huge undertaking and the size of the job accomplished are indicated.

For students in medical administration, Part II will be found to contain much valuable information. Such problems as methods of payment for physicians' and hospital services, the means test, and administrative controls are discussed in terms of the general prob-

lem and current practice in various past and existing plans as a background for the EMIC experience.

Here is material which present and future medical care administrators need to get their teeth into, while the medical care philosophers argue about the future. JESSIE M. BIERMAN

International Approaches to Problems of Undeveloped Areas—*Papers presented at the Round Table on Undeveloped Areas, 1947 Annual Conference of the Milbank Memorial Fund, New York.* 76 pp. Price, $.25.

One of the round tables at the 1947 Annual Conference of the Milbank Memorial Fund considered the demographic background of problems of undeveloped areas and the steps which might be taken in an international approach to these problems as they concern economic development, rural industrialization, and health aspects "in the social evolutionary perspective." Participants included Frank W. Notestein, Henri Laugier, David Weintraub, Leonard B. Rist, Samuel H. Thompson, William P. Forrest and Sir Raphael Cilento.

A specific application of general principles was focused on research and policy in Puerto Rico. Kingsley Davis and Rexford Guy Tugwell were the speakers.

The report develops the theme that genuine world prosperity is indivisible. Good coördination and team work among the different agencies and specialists concerned is necessary for the international approach to these problems. Solutions cannot be imposed from without; they must come from within. REGINALD M. ATWATER

Food Products—*By Henry C. Sherman (4th ed.). New York: Macmillan,* 1948. 428 pp. Price, $4.80.

As a sequel to Sherman's standard text *Chemistry of Food and Nutrition,* the present freshly revised volume is doubly welcome. The book adequately covers the subject matter for a broad general study of foods and food adjuncts. As stated in the preface, "For nearly all of us, food is the largest item in the cost of living and usually the most potent factor in the influence of daily habits upon health. Wise use of food thus means much for satisfaction and welfare. And to use food wisely one should have a fairly wide knowledge of food products."

The 15 chapters consider the several types of foods—fresh, and processed—from the points of view of production, composition, processing, and economics. As one would expect, the author interjects freely much material on nutritive value and dietetics. This adds materially to the value of the book. Each chapter is followed by a list of well chosen suggested readings and reference material. The book closes with an excellent chapter on The Problem of the Best Use of Food: with Some Aspects of Food Economics. A *must* for nutritionists and dietitians, and strongly recommended for physicians, nurses, and public health officials who need a handy reference on food products.

CARL R. FELLERS

Man-Made Plague, A Primer on Neurosis—*By William G. Niederland. New York: Renbayle House,* 1948. 298 pp. Price, $3.50.

This book of only 300 pages presents a very readable and scientific approach to "the great malaise of our time—nervous ailments which have become the most frequent cause of ill-health among civilized men." It comprises ten chapters, among which are: Signals–Symptoms–Sufferings; Neurosis: The Hidden Pain; Problems of Life and Love. Unlike most writers on these topics the author goes directly to the point of what he means, avoiding polysyllabic chatter and expressing his thoughts in

plain, simple language which an intelligent layman can understand. The reader is carried along with a flow of thought from a scholarly and independent thinker who has a first-hand knowledge of human beings as they live and strive in something called social organization. Familiar with psychiatric and psychoanalytic therapies, Dr. Niederland does not proclaim each or any as sales talk panacea. *Man-Made Plague* is a book that should be in the right-at-hand office library of every practising physician, health officer, nurse and social worker.

ESTHER LORING RICHARDS

Practical Bacteriology, Hematology and Parasitology—*By E. R. Stitt, Paul W. Clough, and Sara E. Branham (10th ed.). Philadelphia: Blakiston,* 1948. 989 pp. Price, $10.00.

After approximately forty years and ten editions this book still maintains its place of leadership as a practical reference book in the fields of bacteriology, parasitology, hematology, and clinical pathology. The phenomenal developments of the decade that has elapsed since the previous edition has necessitated extensive reworking of this treatise. The authors have deleted much outdated and less important material in favor of extensive additions of the newer developments in the various fields, particularly in the case of viruses and rickettsiae. They have called upon numerous specialists in the various fields to review the various sections to the end that an authoritative, accurate, and encyclopedic yet eminently practical volume has been produced.

This tenth edition consists of 989 pages divided into the four general subject headings noted above, plus a preface, and an appendix which is packed with useful information concerning laboratory reagents, apparatus, and procedures, together with an excellently arranged and usable index.

As an indication of the current nature of the material in this edition it should be noted that the bacteria taxonomy of the 6th edition of *Bergey's Manual,* which was published about the same time as this book, is used throughout. As in previous editions, the volume is replete with excellent diagrams, charts, tables, illustrations, and photographs. A number of the latter, particularly in the hematology section, are in color.

The book is well printed and firmly bound so that it should stand the rigors of laboratory use. Every public health and medical diagnostic laboratory should have this standard reference book immediately available. It will also be found invaluable by workers in any of the fields of communicable disease control.

M. H. MERRILL

Practical Therapeutics, A Course in—*By Martin Emil Rehfuss, F. Kenneth Albrecht, and Alison Howe Price. Baltimore: Williams & Wilkins,* 1948. 824 pp. Price, $15.00.

This book contains 824 pages of practical, readily usable information in therapeutics. It is a ready reference book for the medical student and for the busy practitioner. A short, concise opening chapter discusses the fundamental problems of modern therapy. The second section is devoted to a very thorough discussion of symptomatic therapy in which the differential diagnosis is presented and treatment for the relief of symptoms offered. Many old and new remedies are briefly, yet completely described. In Section Three the various disease entities as encountered in clinical medicine are given, followed by complete therapeutic directions. A fourth section deals with special treatments. The breadth of the subjects discussed is amazing. No important type of treatment is too insignificant nor any too complex to receive a place in this book.

All forms of therapy are completely

and well presented. Modern drugs, antibiotic agents, radiation, radioisotopes, psychosomatic measures, physical medicine, occupational training, and even nursing care are covered in outline style. The authors leave no room for doubt as to the indications for each drug, the dosage, method and frequency of administration, as well as the results to be anticipated.

The format of the book, the large type, the outline presentation and very complete index make the contents readily and quickly available to the busy practising physician.

GEORGE C. GRIFFITH

Health and Physical Education for Junior and Senior High Schools —*By David K. Brace. New York: Barnes,* 1948. 392 pp. Price, $4.00.

After a brief section on the organization and administration of programs in health education, physical education, recreation, and safety education, this book is devoted almost entirely to a series of short teaching units in health and physical education.

Many teachers will find this volume to be quite helpful in terms of guidance as to objectives, content, procedures, pupil activities, and evaluation of results gained from various suggested learning experiences.

In any attempt to cover two such broad fields as health education and physical education in a single small book it is inevitable that significant problems in both fields will be omitted. In this volume, however, the author covers a great deal of ground because the units presented are very concise and in outline form.

The author should bring his bibliography up-to-date, as many of the references and films cited are too old to give the reader a modern concept of problems in the field of health education. On page 369, for example, health books published in 1919, 1924, and 1928 are included, as are numerous references published in the 30's. New and significant developments come so rapidly in the field of health that these volumes cannot possibly present a current picture. Except for this weakness, the book should be helpful to health educators and physical educators alike.

OLIVER E. BYRD

Blood's Magic for All—*By Alton L. Blakeslee. New York: Public Affairs Committee, Inc.,* 1948. 32 pp. Price, $.20.

This pamphlet presents the story of blood in an unusually clear, well paced and complete fashion which makes excellent reading for lay or professional persons. It describes the development of our knowledge of blood and its components; the functions which these components serve; the various useful products made from blood; the ways in which these products can aid in the medical care of Everyman; the unmet problems and future advances which research on blood will resolve; and finally the story of the ways in which blood has been made available, and the tremendous project undertaken by the American National Red Cross to make blood and blood products available throughout the United States. All this is told with scarcely a flaw in fact or in emphasis, although one might wish that mention had been made of the civilian blood and plasma programs in many of our states, which preceded and laid the practical foundation for the present national program. The pamphlet may be heartily recommended to all health workers—and indeed to all citizens—since "Human blood today is a public health measure . . . It cannot be made synthetically. The only source of supply is the blood bank of human veins . . . The giving (of blood) gives you a personal share in fighting death and disease, in promoting public health. It makes you an active partner in the progress of medicine." GEOFFREY EDSALL

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ALLERGY. WHAT IT IS—WHAT TO DO ABOUT IT. Harry Swartz. New Brunswick, N. J.: Rutgers University, 1949. 203 pp. Price, $2.75.

CURRENT THERAPY 1949. Howard F. Conn, Editor. Philadelphia: Saunders, 1949. 672 pp. Price, $10.00.

DENTISTRY IN PUBLIC HEALTH. Edited by Walter J. Pelton and Jacob M. Wisan. Philadelphia: Saunders, 1949. 352 pp. Price, $5.50.

DIABETES AND ITS TREATMENT. Joseph H. Barch. New York: Oxford University Press, 1949. 326 pp. Price, $10.00.

DOCTORS OF INFAMY. The Story of the Nazi Medical Crimes. Alexander Mitscherlich and Fred Mielke. New York: Henry Schuman, 1949. 165 pp. Price, $3.00.

FETAL AND NEONATAL DEATH. Edith L. Potter and Fred L. Adair. (rev. ed.) Chicago: University of Chicago Press, 1949. 167 pp. Price, $3.75.

HANDBOOK OF DISEASES OF THE SKIN. Richard L. Sutton and Richard L. Sutton, Jr. St. Louis: Mosby, 1949. 719 pp. Price, $12.50.

HIGHWAY SAFETY—A CHALLENGE TO YOUTH. Washington: National Education Asso., 1949. 16 pp. Price, $.30.

INDUSTRIAL FLUOROSIS. Medical Research Council No. 22. John N. Agate, G. H. Ball, G. F. Boddie, et al. London: His Majesty's Stationery Office, 1949. 131 pp. Price, 4s.0d.Net.

MANUAL FOR TEACHING DIETETICS TO STUDENT NURSES. American Dietetic Association. Professional Education Committee and the National League of Nursing Education. Philadelphia: Saunders, 1949. 487 pp. Price, $4.25.

MATERNITY IN GREAT BRITAIN. A Survey of Social and Economic Aspects of Pregnancy and Childbirth undertaken by a Joint Committee of the Royal College of Obstetricians and Gynaecologists and the Population Investigation Committee. New York: Oxford University Press, 1949. 222 pp. Price, $4.00.

MINIMUM STANDARDS FOR SCHOOL BUSSES. Recommendations of National Conference on School Transportation (rev. ed., 1948). Washington: National Education Association, 1949. 58 pp. Price, $.35.

MODERN TRENDS IN PUBLIC HEALTH. Edited by Arthur Massey. New York: Hoeber, 1949. 549 pp. Price, $12.50.

ODORS. PHYSIOLOGY AND CONTROL. Carey P. McCord and William N. Witheridge. New York: McGraw-Hill, 1949. 397 pp. Price, $6.50.

PASTORAL COUNSELLING. Seward Hiltner. Nashville, Tenn.: Abingdon Cokesbury Press, 1949. 286 pp. Price, $3.00.

PROBLEM DRINKER, THE. Joseph Hirsh. New York: Duell, Sloan & Pearce, Inc., 1949. 196 pp. Price, $3.00.

SAFEGUARDING MOTHERHOOD. Sol T. DeLee. Philadelphia: Lippincott, 1949. 123 pp. Price, $2.00.

SAFER WAYS IN NURSING. To Protect Against Tuberculosis. A Guide for Precautions in the Care of Patients. Prepared by the Joint Tuberculosis Nursing Advisory Service of the National League of Nursing Education, National Organization for Public Health Nursing, National Tuberculosis Association, New York: N.T.A., 1948.

SOCIAL SECURITY LAWS, COMPILATION OF THE. Including Pamphlet on Social Security for Children, Washington: Gov. Ptg. Office. 114 pp. Price, $.25.

SOCIAL WORK YEAR BOOK 1949. Margaret B. Hodges, Editor (10th ed.) New York: Russell Sage Foundation, 1949. 669 pp. Price, $4.50.

STANDARDS AND TRAINING PROGRAMS FOR SCHOOL BUS DRIVERS. Recommendations of National Conference on School Transportation. Washington: National Education Assn., 1949. 24 pp. Price, $.30.

SUICIDE AND THE MEANING OF LIFE. M. von Andics. Pacoima, Calif.: The Sherwood Press, 1947. 219 pp. Price, $3.00.

STUDIES IN AIR HYGIENE. Medical Research Council No. 262. R. B. Bourdillon, O. M. Lidwell, and J. E. Lovelock. London: His Majesty's Stationery Office, 1948. 356 pp Price, 7s 6d. Net.

TUBERCULOSIS OF THE KNEE JOINT. Johannes Mortens. Copenhagen: Einar Munksgaard, 1948. 550 pp. Price, Dan.kr. 30.

VENEREAL DISEASES, THE. James Marshall (2nd. ed.) New York: Macmillan, 1949. 360 pp. Price, $5.50.

YOUR CHILD FROM 6 TO 12. Children's Bureau Publication No. 324. Washington: Gov. Ptg. Office, 1949. 141 pp. Price, $.20.

THE FOLLOWING REPORTS HAVE BEEN RECEIVED

AMERICAN NATIONAL RED CROSS. ANNUAL REPORT 1948. Washington: A.N.R.C. 187 pp.

ARLINGTON COUNTY, VIRGINIA. ANNUAL REPORT, 1948. Arlington, Va.: Department of Health. 52 pp.

CATTARAUGUS COUNTY, OLEAN, NEW YORK. 24TH ANNUAL REPORT FOR THE YEAR ENDING DEC. 31, 1946. Olean, N. Y.: County Department of Health. 57 pp.

CITY OF COVENTRY, ENGLAND. ANNUAL REPORT 1947. T. Morrison Clayton, Medical Officer. Coventry, England: Dept. of Health. 55 pp.

CLEVELAND'S HEALTH. ANNUAL REVIEW 1947. Cleveland, Ohio: City Department of Public Health and Welfare, Division of Health. 40 pp.

COMMONWEALTH FUND. ANNUAL REPORT 1948. New York: Commonwealth Fund, 1949. 48 pp.

DALTON-WHITFIELD COUNTY HEALTH DEPARTMENT, 1948. Dalton, Ga.: Department of Health.

ENVIRONMENTAL AND OCCUPATIONAL CANCER. W. C. Hueper. Washington: Gov. Ptg. Office, 1949. 69 pp. Price, $.20.

FACTORS AFFECTING RESPONSE TO A FREE CHEST X-RAY SURVEY. A Study Conducted in South Jamaica, Queens County, N. Y. Ruth Wiseman. Jamaica, N. Y.: Queensboro Tuberculosis and Health Asso., Inc., 1949. 15 pp.

HAWAII, TERRITORY OF. ANNUAL REPORT OF THE BOARD OF HEALTH, 1948. Honolulu, Hawaii: Territory of Hawaii, Board of Health. 170 pp.

HAWAII'S HOSPITALS, PAST, PRESENT AND FUTURE. Raymond G. Nebelung and Robert C. Schmitt. Honolulu, Hawaii: Public Health Committee, 1948. 73 pp.

HEALTH IN NORTH DAKOTA. 30TH BIENNIAL REPORT July 1, 1946–June 30, 1948. Bismarck, N. D.: North Dakota State Department of Health. 131 pp.

HOMELESS MEN IN NEW YORK CITY. Report of the Project Committee on Homeless Men of the Welfare Council of New York City, New York, N. Y.: Welfare Council of New York City, 1949. 43 pp. Price, $.50.

INTERSTATE CONFERENCE ON RABIES CONTROL (Resumé). Hotel Roosevelt, New York, N. Y., December 15, 1948. Joint Legislative Committee on Interstate Coöperation. Albany, N. Y.: State Department of Health. 15 pp.

NATIONAL COMMISSION ON SAFETY EDUCATION. ANNUAL REPORT 1948. Washington, D. C.: National Education Association. 15 pp.

NATIONAL SOCIAL WELFARE ASSEMBLY. 1948 ANNUAL REPORT. New York: N.S.W.A., 1948. 35 pp.

NUFFIELD PROVINCIAL HOSPITALS TRUST, THE. A Report on the Purpose and Activities of the Trust 1939–1948. England: Oxford University Press, 1949. 54 pp.

PRETORIA, AFRICA, CITY COUNCIL OF. ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH 1946–1947. 79 pp.

PUBLIC HEALTH IN MARYLAND. 1947. Baltimore: State Department of Health, 1948. 46 pp.

REGULATIONS FOR LICENSING OF CONVALESCENT AND NURSING HOMES ALSO REGULATIONS FOR LICENSING OF BOARDING HOMES FOR THE AGED. Boston, Mass.: Massachusetts Department of Public Health.

RUSSELL SAGE FOUNDATION. ANNUAL REPORT 1947–1948. New York: Russell Sage Foundation. 18 pp.

SOCIAL SCIENCE RESEARCH COUNCIL ANNUAL REPORT 1947–1948. New York: Social Science Research Council. 73 pp.

THESE BEAR THE TORCH. Five Years of Progress in Mental Hygiene. Albany, N. Y. Department of Mental Hygiene. 50 pp.

THE UNEXPECTED GIFT. Dorothy Stephens Laird. Gainesville, Fla.: Project in Applied Economics, College of Education, University of Florida, 1948. 51 pp. Price, $.35.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Best Foot Forward—It is often a rewarding experience to see our native ways of doing things exposed for foreign examination. You will not be disappointed in this portrayal of our exuberant health educational activities reported by one of us who knows them inside and out. They are peculiarly American and we like them, he says.

BAUER, W. W. Health Education in the United States. Health Education J. (British) 7, 1:7 (Jan.), 1949.

On Our Way—We are progressing in our American studies of the efficacy of BCG. In the New York State plan, immunization is being extensively used with tuberculin-negative reactors who are occupationally exposed — nurses, medical students, hospital personnel.

BIRKHAUG, K. E. New Developments in BCG Vaccination. New York State J. Med. 49, 4:401 (Feb. 15), 1949.

Department of Semantics—What unfathomable gulfs exist in meanings of some plain English words as they are used on the opposite sides of the Atlantic Ocean! Across the water "social medicine" are words of distinction. Here they are something to be spat out at an adversary. Discussing postgraduate training for public health, this Britisher suggests a "diploma in social medicine." Imagine the consequences hereabouts.

BROCKINGTON, F. Social Medicine in Great Britain. Canad. Pub. Health J. 40, 1:22 (Jan.), 1949.

To Clear Away Some Confusion—Principally because it appears outside the usual run of bacteriological, medical or public health journals, your attention is called to this committee's opinion about what is, and what isn't, polio virus.

COMMITTEE ON NOMENCLATURE (NFIP). A Proposed Provisional Definition of Poliomyelitis Virus. Science 108, 2817:701 (Dec. 24), 1948.

As a Part of Social Security—What will interest you most—once you've recovered from your first amazed comprehension that this matter-of-fact account is describing the very same service depicted by most Americans as the hideous invention of the old Nick himself—is the change in local public health activities under the (British) National Health Service Act. Local health authorities will continue to administer maternal and child health projects, public health nursing services, immunizations, and special tuberculosis control and mental health activities, though they are relieved of hospital administration.

DAVIS, B. M. The British National Health Service. Pub. Health Rep. 64. 5:161 (Feb. 11), 1949.

Things We Don't Know about Pneumonia—On the reasonable assumption that what I can understand will be readily intelligible to all health workers, and may prove of interest to them as well, I thumb the specialty journals — bacteriological, immunological, etc.—in search of papers of use to others than the specialists. This one is about immunological paralysis. It proved to be somewhat beyond my depth but if you can keep afloat, you may get some new insight into the difficulties that plague researchers in pneumonia prophylaxis.

FELTON, L. D. The Significance of Antigen in Animal Tissues. J. Immunol. 61, 1:107 (Jan.), 1949.

A Simply Must—Maybe it's no more than just a sign of our own *Jour-*

nals' broad-mindedness, but this Annotated Bibliography's chief function seems to be to tell you about topnotch papers in rival scientific publications. Do not fail to read this one! Not only is it bread and butter, but it's dessert, too—nutritious orientation in an important social problem plus delectable writing! After discussing the way most Americans marry, divorce, and remarry, and behave in between, the writer comments, "They are amazingly legal about their immorality."

HILL, R. The American Family. Pub. Health Nurs. 41, 1:3 (Jan.), 1949.

Not To Be Read While Running—Quote. Perhaps the most exciting single event relative to human nutrition during the past year has been the isolation of vitamin B_{12} Unquote. For details of excitement see concentrated, capsule review.

KING, C. G. New Advances in the Science of Nutrition. J. Am. Dietet. A. 25, 2:109 (Feb.), 1949.

Epidemiologic Evidence—It seems that faulty plumbing must have been wildly imputed by persons unnamed to be responsible for the spread of polio. Two U.S.P.H.S. officers underscore the groundlessness of the accusation. Though other means cannot be ruled out, person-to-person contact is assumed to be the usual way the disease is spread, they say.

KRUSE, C. W., AND QUINBY, G. E. Plumbing Is Not Guilty of Polio. Plumbing and Heating 11, 6:24 (Jan.), 1949.

Nutrition is More Than Meals—Environment determines largely the state of nutrition and influences the incidence of malnutrition as well as its characteristics and manifestations. Environment also alters dietary requirements. That's the best I can do at reducing 90 pages of text to a couple of sentences. It's not any too revealing, is it? Well, try your hand at it.

KRUSE, H. D. A Concept of the Etiological Complex of Deficiency States with Especial Consideration of Conditions. Milbank Quart. 27, 1:5 (Jan.), 1949.

Answer: Tight Ones Do—To help determine whether gauze face masks do much good, rabbits (some covered with gauze masks, some uncovered) were exposed to an atmosphere heavily saturated with virulent bovine TB. There was a 90–95 per cent reduction of incidence of infection among the masked animals. Under normal exposure the protection might be expected to be complete.

LURIE, M. B., AND ABRAMSON, S. Do Masks Protect? Am. J. Nurs. 49, 2:100 (Feb.), 1949.

Something They Drank?—There wasn't enough milk to go round, so the enlisted men got only a ladle full on their morning cereal. What was left in the serving dishpan was then decanted into pitchers and later served to officers—as much as they wanted to drink. An explosive outbreak of polio occurred. One in 188 of the enlisted men came down with the disease. One in every 19 of the officers was attacked; and their infections were much more severe. Are you thinking what I'm thinking?

MATHEWS, F. P. Poliomyelitis Epidemic Possibly Milk-Borne in a Naval Station, Portland, Oregon. Am. J. Hyg. 49, 1:1 (Jan.), 1949.

Interesting Facts Department—At the peak of a polio epidemic only two species of blow flies, among all that were trapped, yielded positive tests for polio. Two weeks later house flies, flash flies, and the black blow fly were infected. Then came a spell when no flies carried polio, and as the epidemic subsided one species of blue bottle fly became positive again.

MELNICK, J. L. Isolation of Poliomyelitis Virus from Single Species of Flies Collected during an Urban Epidemic. Am. J. Hyg. 49, 1:8 (Jan.), 1949.

Now They Sterilize First—Six laundry workers who handled soiled linen from a laboratory where research with Q fever was carried on came down with the disease. Seven fellow employees in the laundry, who had no contact with the linen, remained free of infection.

OLIPHANT, J. W., *et al.* Q Fever in Laundry Workers, Presumably Transmitted from Contaminated Clothing. Am. J. Hyg. 49, 1:76 (Jan.), 1949.

Anent Rod-Sparing and Child-Spoiling—This may not be as new and unusual as I think it is, but still it should be brought to your eyes. In Rochester a letter was sent to all mothers of 2½ year olds inviting them to bring the youngsters to the Health Institute for a check-up which constituted a Revised Stanford-Binet test plus interpretive advice. For what happens thereafter, see paper.

ROBERTS, K. E., AND ALLDRICH, C. A. A Program To Foster Adjustment in Young Children. Pediatrics 3, 2:195 (Feb.), 1949.

Good News—Though this is therapy it is a concern of preventive medicine. A small number of cases of primary, atypical, non-bacterial pneumonia responded well to treatment with aureomycin. The rickettsias and some of the viruses, apparently, have at last found their chemotherapeutic come-uppance.

SCHOENBACH, E. B., AND BRYER, M. S. Treatment of Primary Atypical Non-Bacterial Pneumonia with Aureomycin. J.A.M.A. 139, 5:275 (Jan. 29), 1949.

Here's A What-Dun-It? For You—From a slum area in Stockton-On-Tees a group of people was moved to a new housing project. During a five year period a check was kept on the health of the happy 710. Standardized death rates among the fortunate ones rose materially and were consistently higher than among the unfortunate controls who remained in the slums. Can you figure out a reason?

SHANK, R. E. Nutrition in Preventive Medicine. Nutrition Rev. 7, 1:1 (Jan.), 1949.

Not Yet Foolproof—Of first importance to child hygienists is this study of a very small number of serious reactions following pertussis vaccination, and the ways by which even this minute fraction of unhappy endings among all the army of protected children might have been avoided.

TOOMEY, J. A. Reactions to Pertussis Vaccine. J.A.M.A. 139, 7:448 (Feb. 12), 1949.

ASSOCIATION NEWS

SEVENTY-SEVENTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
NEW YORK, N. Y., OCTOBER 24–28, 1949

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Luis Alverez, Jr., M.D., 1441 Fernandez Juncos Ave., Santurce, P. R., Director of Public Health Unit, Catano, P. R.

Capt. M. J. Aston, (MC) USN, Naval Medical School, Bethesda 14, Md., Medical Officer in Command

Ann McAvoy Birch, M.D., 749 Washington St., New York 14, N. Y., Health Officer-in-Training, City Health Dept.

Charles A. Bourdon, M.D., M.P.H., 775 Gosford St., City Mall Annex, Montreal 1, Que., Canada, Special Officer and Chief of Health Districts, City Health Dept.

Charles E. Brenn, M.D., 227½ West 4th St., Owensboro, Ky., Health Officer, Owensboro-Daviess County Health Dept.

George M. Brother, M.D., M.P.H., 1098 West Michigan St., Indianapolis 7, Ind., Director of Preventive Medicine, State Board of Health

Dorothy B. Chamberlin, M.D., Housatonic, Mass., Apprentice Epidemiologist, New York State Health Dept.

Tracy Jones, M.D., 620 South Third, Louisville 2, Ky., Asst. State Health Commissioner, State Dept. of Health

Leo A. Kaprio, M.D., M.P.H., Abrahams St. 15 b A 11, Helsinki, Finland, Health Officer, Province of Uusimaa Health Dept.

M. Catherine Magee, M.D., 132 E. 45th St., New York 17, N. Y., Candidate for M.P.H., Columbia Univ. School of Public Health

G. P. Morison, M.D., Professional Bldg., Charlestown, W. Va., Director, Tri-County Health Dept.

Thomas R. Perdue, M.D., 1606 Linwood, Parsons, Kans., Asst. Health Officer, Labette County Health Dept.

A. E. Raitt, M.D., M.P.H., 215 5th St., Colusa, Calif., Health Officer, Colusa County Health Dept.

Huston K. Spangler, M.D., Belmont Hospital, Worcester, Mass., Superintendent

H. F. Wilkins, D.V.M., Capital Station, Helena, Mont., State Veterinarian of Montana

Laboratory Section

Philip R. Edwards, Ph.D., U.S.P.H.S., 605 Volunteer Bldg., Atlanta, Ga., Bacteriologist in charge of Enteric Bacteriology Laboratories, Communicable Disease Center

Thomas P. Galarneault, Jr., 716 South Ashland Blvd., Chicago 12, Ill., Graduate Student of Bacteriology, Loyola Univ.

Dorothy J. Granger, 5960 Chabolyn Terrace, Oakland 18, Calif., Public Health Laboratory Technician, Alameda County Health Dept.

Lewis W. Jones, Utah State Agricultural College, Logan, Utah, Asst. Professor of Bacteriology

Elfriede Klaucke, 249 Belmont St., Worcester, Mass., Asst. Bacteriologist-Serologist, City Health Dept.

Edwin H. Lennette, M.D., Ph.D., 1392 University Ave., Berkeley 2, Calif., Chief, Viral and Rickettsial Disease Laboratory, State Dept. of Public Health

Milford N. Lunde, M.P.H., 1716-A E. Washington St., Charlestown, W. Va., Junior Bacteriologist, State Hygienic Laboratory

Arthur A. Rosenberg, M.S., Venereal Disease Research Lab., U.S.P.H.S., Staten Island, N. Y., Serologist

Luis A. Rubio, 172 Villamil St., Santurce, P. R., Student of Medical Technology, School of Tropical Medicine

Doris V. Shay, 614 Willow, Trinidad, Colo., Bacteriologist, Branch Laboratory, State Board of Health

Bernice S. Stevens, 300 Hall Ave., Jamestown, N. Y., Bacteriologist in charge of Serology, Jamestown Municipal Laboratory

Statistics Section

Jewel E. Godwin, M.A., 2122 California St., Apt. 655, Washington 8, D. C., Health Program Representative, U. S. Public Health Service

William Holland, LL.M., 1 Madison Ave., New York, N. Y., Medical Statistics Analyst, Metropolitan Life Insurance Co.

Elizabeth H. Jackson, Ph.D., 420 West 116 St., New York, N. Y., Research Staff Member, Milbank Memorial Fund

Robert S. Levin, 1 Madison Ave., New York, N. Y., Accident Statistics Analyst, Metropolitan Life Insurance Co.

Mary S. Louie, 2114 14th Ave., Oakland 6, Calif., Public Health Statistician, Alameda County Health Dept.

Samuel C. Marcus, 1746 Hobart St., N. W., Washington, D. C., Biostatistician, National Institutes of Health

Marian M. Martin, 710 S. W. St. Clair, Portland 5, Ore., Statistician, State Board of Health

Edith H. Rafton, 1 Madison Ave., New York, N. Y., Supervising Medical Statistics Asst., Metropolitan Life Insurance Co.

Doris M. Strail, 4321 North Mozart St., Chicago 18, Ill., Statistician-Supervisor, Tuberculosis Institute of Chicago and Cook County

Margaret C. Taylor, 8607 Piney Branch Rd., Apt. 103, Silver Spring, Md., Consultant on Medical Records, Medical Research Statistics Division, Veterans Administration

Engineering Section

James A. Anderegg, M.S., 64 Westgate, Cambridge 39, Mass., Asst. in Sanitary Engineering, Massachusetts Institute of Technology

Lambert B. Cain, 900 East 77th Terrace, Kansas City, Mo., Public Health Engineer, City Health Dept.

Konchady Dayananda, S.M., % Dr. Abel Wolman, Johns Hopkins Univ., Baltimore 18, Md., Student

Solomon Galler, 261 East Way, Brooklyn 29, N. Y., Health Inspector, New York City Health Dept.

Eli Glogow, 474 So. La Peer Drive, Beverly Hills, Calif., Student, Univ. of California at Los Angeles

Albert Grego, 1120 West Maine Ave., Baldwin Park, Calif., Junior Sanitarian, Los Angeles City Health Dept.

John P. Lynch, West Parish Filters, Westfield, Mass., Chemist and Bacteriologist, Springfield Water Dept.

Henry L. Roahrig, 240 Peabody St., N. W., Washington 11, D. C., Sanitary Engineer, U. S. Public Health Service; Exec. Secy., Sanitation Study Section, National Institutes of Health

H. L. Thomasson, 1098 W. Michigan, Indianapolis, Ind., Public Health Sanitarian, State Board of Health

Albert Q. Y. Tom, M.S., 8 Homer St., Brookline, Mass., Research Assoc., Massachusetts Institute of Technology

Wilbur J. Widmer, M.S., Box U-37, Dept. C.E., Univ. of Connecticut, Storrs, Conn., Instructor of Civil Engineering

Wallace S. Zeray, 25 Pent Highway, Fairfield, Conn., Sanitarian, Norwalk Health Dept.

Industrial Hygiene Section

Louis F. Garber, M.P.H., 813 Moreau Drive, Jefferson City, Mo., Public Health Engineer, State Division of Health

Capt. Vincent Hernandez, (MC), USN, Naval Medical School, Bethesda, Md., Exec. Officer

Mary-Elizabeth H. Kent, M.D., 1411 North Gregson St., Durham, N. C., Asst. Director, Employee's Health Service, American National Red Cross

Pablo P. Recarte, M.D., M.P.H., Banco de Seguros del Estado, Calle Agraciada, Montevideo, Uruguay, S. A., Chief, Service of Industrial Hygiene

Adolph W. Schmidt, M.B.A., 525 William Penn Place, Pittsburgh 30, Pa., Vice-President and Governor, T. Mellon & Sons

Food and Nutrition Section

Conrado F. Asenjo, Ph.D., School of Tropical Medicine, San Juan, P. R., Head, Dept. of Chemistry and Nutrition

Graciela Delgado, Box 913, Mayaguez, P. R., Nutritionist, P. R. Public Health Service

Zean Gassmann, 160 North LaSalle St., Chicago 1, Ill., Supt., Division of Foods and Dairies, Illinois Dept. of Agriculture

Cora J. Northington, Health Center, Dalton, Ga., Nutritionist and Health Educator, Dalton-Whitfield County Health Dept.

Agnes Schulz, 3400 N. Eastern, Oklahoma City, Okla., Nutrition Consultant, State Dept. of Health

A. P. Stewart, Ph.D., 425 Battery St., San Francisco, Calif., Research Administrator, Golden State Co., Ltd.

Maternal and Child Health Section

Marion G. Josephi, M.D., 2629 Dwight Way, Berkeley, Calif., Child Health Consultant, State Dept. of Public Health

Geraldine Piper, M.S., 3400 N. Eastern, Oklahoma City, Okla., Nutrition Supervisor, State Dept. of Health

Jean B. Sweeley, M.S.W., 1719 N. 18th St., Boise, Ida., Medical Social Worker, Crippled Children's Service, State Dept. of Public Health

Public Health Education Section

Laura H. Berkeley, 2090 Morris Ave., New York, N. Y., Asst. in Health Education, City Dept. of Health

Kathleen S. Boland, 144 Pawling Ave., Troy, N. Y., Health Educator-in-Training, State Health Dept.

Mary E. Chilson, M.P.H., Cabarrus County Health Dept., Concord, N. C., Public Health Educator

Irene H. DeSarmo, M.P.H., P. O. Box 110, Redwood City, Calif., Health Education Consultant, San Mateo County Health Dept.

Peter W. Edwards, M.B., Cheshire Joint Sanatorium, Market Drayton, Salop, England, Medical Supt.

Mabel Foster, 121 Fairview Ave., Stamford, Conn., Nursing Field Representative, American National Red Cross

Edward M. Gunn, M.D., 4105 Warner St., Kensington, Md., Chief, Army Medical Illustration Service, Army Institute of Pathology

Beatrice A. Hruska, R.N., M.P.H., Montana Tuberculosis Association, Helena, Mont., Director of Health Education

Arthur Kneerim, 1 Madison Ave., New York, N. Y., Director, Field Service Bureau, Health and Welfare Division, Metropolitan Life Insurance Co.

Carmen LaFontaine, Box 59, Rio Piedras, P. R., Medical Social Worker, P. R. Health Dept.

Ada Miller, M.J., 411 Equitable Bldg., Baltimore 2, Md., Exec. Secy., Maryland Society for Prevention of Blindness

Adolfo L. Monserrate-Anselmi, Box 322, Rio Piedras, P. R., President and Exec. Director, P. R. Pharmaceutical Assn.

Nancy C. Ott, M.A., International House, Berkeley 4, Calif., Graduate Student in Health Education, School of Public Health, Univ. of California

Mary Pollard, M.P.H., State Health Dept., P. O. Box 711, Santa Fe, N. M., Health Education Consultant

Mefford R. Runyon, 47 Beaver St., New York, N. Y., Exec. Vice-President, American Cancer Society

Eric S. Smith, 5474 Vine St., Vancouver, B. C., Canada, Acting Sanitary Inspector, Dept. of National Health and Welfare

Philip L. Weinstein, M.P.H., P. O. Box 1078, Bellingham, Wash., Health Educator, Bellingham and Whatcom Co. Health Dept.

Public Health Nursing Section

Clarissa E. Barnett, 759 Main St., Leominster, Mass., Nurse in Charge, Leominster Chapter, American Red Cross Nursing Service

Elizabeth P. Bradley, R.N., City Hall Bldg., Lawrence, Kans., Public Health Nurse, Lawrence-Douglas County Health Dept.

Virginia P. Cranshaw, M.P.H., Mary Kirkland Hall, Vanderbilt Univ., Nashville, Tenn., Asst. Professor of Medical Nursing

Germaine A. Emerson, Grandview Apts. 105, Kelso, Wash., Supervisor of Public Health Nurses, Cowlitz-Wahkiakum County Health Dept.

Rafaela Rodena-Garcia, 1958 Eduardo Conde Ave., Santurce, P. R., Public Health Nurse, P. R. Public Health Service

Vera P. Hansel, R.N., M.A., U.S.P.H.S., 239 Federal Office Bldg., San Francisco, Calif., Mental Health Nurse Consultant

Juliette Julien, B.S., 179 2nd St., Troy, N. Y., Director of Nursing, Rensselaer County Health Dept.

Veronica R. Marks, R.N., B.S., 709 Kilmer Press Bldg., Binghamton, N. Y., Acting District Supervising Nurse, State Health Dept.

Helen B. Meister, R.N., B.S., P. O. Box 221, Parsons, Kans., Supervisor of Public Health Nurses, Labette County Health Dept.

Ann Miller, M.N., Tohoku Mil. Govt., APO 309, % Postmaster, San Francisco, Calif., Regional Public Health Nurse

Edith L. Mitchell, R.N., B.S., 2324 Pacific Ave., Tacoma 2, Wash., Supervisor of Nurses, Pierce County Health Dept.

Clara L. Nicholson, R.N., B.S., 1618 23rd Ave., Longview, Wash., Staff Nurse, Cowlitz-Wahkiakum County Health Dept.

Dorothy K. Pollack, R.N., B.S., 5421 Baywood St., Pittsburgh 6, Pa., Student, Univ. of Pittsburgh

Josephine Remley, 123 Columbia Terrace, Peoria, Ill., Nursing Consultant, Division of Services for Crippled Children, City Health Dept.

M. Christine Rennie, C.P.H., 42 Howe St., New Haven, Conn., Student, Yale School of Public Health

Anita L. Schuelke, R.N., B.S., 224 Malone Ave., Peoria, Ill., Director of Nurses, Peoria County Health Dept.

Mary M. Scott, R.N., B.S., 1800 East 21st, Topeka, Kans., Consultant in Maternal and Child Health, State Board of Health

Ruth H. Sprague, R.N., M.P.H., Wayne County Health Dept., Henry Ruff Rd., Eloise, Mich., Orthopedic Nursing Consultant

Inez B. Trelstad, R.N., B.S., 1908 8th Ave., North, Seattle 9, Wash., Chief Nurse,

Regional Office, Veterans Administration

Cecilia E. Walsh, B.S., 136 Whitford Ave., Providence 8, R. I., Director, District Nursing Association of Fall River, Mass.

Alice Westerberg, R.N., B.S., 22 Glenbrook Rd., Stamford, Conn., Director, Port Chester Visiting Nurse Assoc.

Epidemiology Section

Ralph E. Dwork, M.D., M.P.H., 899 Montgomery St., Brooklyn 13, N. Y., Graduate Student, Columbia Univ. School of Public Health

Morris A. Granoff, M.D., 327 Whalley Ave., New Haven 11, Conn., Asst. Epidemiologist, New Haven Health Dept.

Jose A. Hernandez-Matos, M.D., P. O. Box 194, Rio Piedras, P. R., Epidemiologist, Insular Health Dept.

M. Elizabeth Leeds, R.N., B.S., Federal Security Bldg., South, Rm. 5524, Washington, D. C., Research Nurse, Division of Tuberculosis Control, U. S. Public Health Service

L. J. Peters, M.D., 2238 Professor St., Cleveland 13, Ohio, Medical Inspector, Department of Health

Warren Winkelstein, Jr., M.D., Office of Prof. Training & Recruitment, State Health Dept., Albany, N. Y., Apprentice Epidemiologist

School Health Section

Richard R. Abbot, M.S., Western Illinois State College, Macomb, Ill., Health Coordinator

Henry F. Fricker, 540 Lowell Ave., Palo Alto, Calif., Graduate Student in Health Education, Stanford Univ.

Daniel I. McLean, M.D., 5357 9th Ave., Los Angeles 43, Calif., Acting Physician Supervisor, Los Angeles City Schools

Dental Health Section

William H. D'Abbraccio, D.D.S., 613 Chalkstone Ave., Providence, R. I., Dentist

Lloyd F. Richards, D.D.S., P. O. Box 555, Berkeley, Calif., Graduate Student, School of Public Health, Univ. of California

Medical Care Section

Arthur M. Alden, M.D., 1127 Pine St., St. Louis, Mo., Chief of Staff, Labor Health Institute

David F. Burgoon, 2931 South Columbus St., Arlington, Va., Laboratory Specialist, U. S. Public Health Service

Tracy Copp, 624 South Quincy St., Green Bay, Wis., Board Member, Green Bay Curative Workshop

Seymour Etkin, M.A., 2nd & Auburn Ave., Rt. 1, East Riverdale, Md., Economist, Bureau of Census, Dept. of Commerce

Henry G. Farish, M.D., M.H.A., 134 Lewis St., Southampton, N. Y., Administrator, Southampton Hospital Assoc.

Zelma Fluharty, R.N., B.S., Presbyterian Hospital, Denver 6, Colo., Director of Nursing Education and Nursing Service

William Freeman, M.D., 473 June St., Fall River, Mass., Pathologist and Director of Laboratories, Truesdale Hospital

J. F. Friedheim, M.A., Jameson Memorial Hospital, New Castle, Pa., Director

Gwen Goodrich, University of Wisconsin, Madison 5, Wis., Instructor in Schools for Workers

Charles M. Grossman, M.D., University of California, Berkeley, Calif., Research Fellow in Biochemistry

Esther R. Hauptli, R.N., M.A., 534 Walhalla Rd., Columbus, Ohio, Medical Social Work Consultant, Ohio State Dept. of Public Welfare

Charles Hilsenroth, 2423 Dexter Ave., Silver Spring, Md., Hospital Program Analyst, U. S. Public Health Service

George H. Hoxie, M.D., A.M., 2808 Hillegass Ave., Berkeley, Calif., Retired Physician

William A. MacColl, M.D., 201 Securities Bldg., Seattle 1, Wash., Pediatrician, Group Health Cooperative of Puget Sound

Hugh McCulloch, M.D., 6501 S. Promontory Drive, Chicago 49, Ill., Medical Director, Council on Rheumatic Fever, Heart Assoc., Chicago

Francis C. MacDonald, M.D., 39 Main St., Concord, Mass., Director, Harvard Pediatric Study

Hugh Montgomery, M.D., Hospital of Univ. of Pennsylvania, Philadelphia 4, Pa., Asst. Professor of Clinical Medicine, Medical School

Dorothy A. Oates, 33 Atlantic Terrace, Lynn, Mass., Supervisor of Physical Restoration, Division of Vocational Rehabilitation, Massachusetts Dept. of Education

James N. O'Brien, M.D., 112 Market St., Harrisburg, Pa., Chief Medical Consultant, Bureau of Rehabilitation, State Board of Vocational Education

John E. Petersen, M.S., Welfare Council, 729 S. Figueroa St., Los Angeles 14, Calif., Director, Health Division

Mortimer S. Rayman, M.D., Two Harbors, Minn., General Practitioner, Community Health Center

Marion Rickert, 11 South Lake Ave., Albany 3, N. Y., Supervisor of Medical Social Work, State Dept. of Social Welfare

Mary Roddy, M.Sc., 616 K. St., Sacramento, Calif., Medical Social Work Consultant, State Dept. of Social Welfare

Aldo S. Romiti, 119 West 117th St., Seattle,

Wash., Exec. Asst., Physical Medicine Rehabilitation Division, Veterans Administration

Sidney C. Selkovits, M.D., 105 Beaver St., Sewickley, Pa., Medical Consultant, Bureau of Rehabilitation, State of Pennsylvania

Theodate H. Soule, M.A., 525 East 68th St., New York 21, N. Y., Director of Social Service, New York Hospital

A. G. Stasel, 1009 Nicollet Ave., Minneapolis, Minn., Administrative Director, Eitel, Franklin and Parkview Hospitals

Louise O. Waagen, 3130 Wisconsin Ave., N.W., Apt. 115, Washingtin 16, D. C., Chief, Nursing Section, Division of Hospital Facilities, U. S. Public Health Service

Douglas N. West, M.S.P.H., 1540 East-West Highway, Silver Spring, Md., Chief, Office of Program Operation, Division of Hospital Facilities, U. S. Public Health Service

Unaffiliated

Louise A. Bailey, 5528 S. Hyde Park Blvd., Chicago, Ill., Consultant in Physical Therapy, National Society for Crippled Children and Adults

Mrs. Z. H. Coberly, China Training Institute, Chiaoton Tseng, Kiangsu, China, Midwifery Teacher, Seventh Day Adventists Mission

Floyd S. Daft, Ph.D., National Institutes of Health, Bethesda 14, Md., Chief, Laboratory of Biochemistry and Nutrition

Richard L. Dills, Box 489, Pasco, Wash., General Sanitarian, Benton-Franklin County Health Dept.

Mildred Erickson, M.S.W., 1209 Burlingame Ave., Rm. 203, Burlingame, Calif., Exec. Secy., Council of Social Agencies of San Mateo County

Dr. B. L. Frank, 1235 McGill College Ave., Montreal, Que., Canada, Medical Director, Ciba Co., Ltd.

Heber R. Harper, Ph.D., 321 Equitable Bldg., Denver 2, Colo., Regional Director, Federal Security Agency

Edwards A. Park, M.D., M.A., Johns Hopkins Hospital, Baltimore 5, Md., Professor Emeritus of Pediatrics, Johns Hopkins Univ.

Eugene J. Pope, D.V.M., P. O. Box 72, Norfolk 1, Va., City Veterinarian

Eloise R. Robins, 803½ East Main St., Richmond 19, Va., Secy., Health Division, Richmond Area Community Council

Adolph S. Rumreich, M.D., Dr.P.H., 381 Marion Ave., Glen Ellyn, Ill., Medical Director, U. S. Public Health Service; Liaison Officer, Fifth Army

James E. Scatterday, D.V.M., P. O. Box 210, Jacksonville, Fla., Public Health Veterinarian, State Board of Health

Anna L. Sweeley, M.A., 1719 N. 18th St., Boise, Ida., Physical Therapy Consultant, Crippled Children's Service, State Dept. of Public Health

Ruth Taylor, Municipal Hospital, Pittsburgh 13, Pa., Hospital Manager, City Dept. of Public Health

Edwin G. Williams, M.D., D.T.M., U. S. Public Health Service, Washington 25, D. C., Chief, Office of Radiological Health

---

ENGINEERING SECTION PROJECT CONTINUED FOR 1949

In 1946, under the impetus of the Engineering Section Council, a special project was established under the title Engineering Section Project. The purpose of the Project, briefly, was to explore ways by which wider use of properly trained engineers and sanitarians could be obtained, and what type of training was desirable for the various types of specialists employed in the environmental sanitation field. The Project had as another goal that of citing administrative techniques, procedures and programs in the field of interest of the Engineering Section. Sufficient funds for a two year project were obtained from the National Foundation for Infantile Paralysis and a group of sanitary engineering manufacturing industries. During 1947 and 1948, the Project has been carried on with enthusiasm under the advice of the Engineering Section Council and a specially formed advisory committee representing the Standing Committees of the Association and the Engineering Section. William T. Ingram has served as the Engineering Field Associate carrying on the Project.

Much has been done in achieving the original goals of the Project, so it is with a great deal of satisfaction that we announce the continuation of the Project through 1949 through

funds generously made available from

The National Sanitation Foundation
The American Can Company
Wallace & Tiernan Co., Inc.

In addition, funds have been made available from the National Security Resources Board for the Preparation, by the Engineering Section Project, of a roster of engineering personnel. Other activities of the Project during 1949 will center around consultation with various universities on course content for engineers and sanitarians; establishment of short courses for the training of water works, sewage plant, and food handling personnel. In addition, a great deal of time will be spent in establishing and supervising a research project in administrative procedures made possible by a grant through the U. S. Public Health Service.

PROGRESS OF THE MERIT SYSTEM SERVICE, A.P.H.A.

As of February 1, 1949, the Merit System Service reports that 523 examinations have been prepared and used by 37 states in the following fields of public health: environmental sanitation, health education, laboratory, medical social work, medicine and public health, nursing and public health nursing, nutrition, and vital statistics.

In addition, 8 cities have used 11 examinations for public health positions and 20 programs of study in public health nursing and 11 visiting nurse associations have used the guidance tests for students and staff nurses. Two schools of engineering have used student tests and a licensing examination for health officers and inspectors has been provided in New Jersey.

Examinations are in preparation in several new areas: pharmacy, veterinary medicine, psychology, hospital nursing positions (consultant level), and dietetics.

New consultants who have joined the staff within the past year are:

Agnes Landis, Ph.D. (Psychology), Clinical Psychologist, Director of Research, Regional Office, Veterans Administration, Brooklyn, N. Y.

Catherine Leamy (Nutrition), Regional Nutrition Consultant, Children's Bureau, New York, N. Y.

Leonora B. Rubinow (Medical Social Work), Newark, N. J.

Alexander Zeissig, D.V.M. (Veterinary Medicine), Veterinary Consultant, Division of Medical Science, New York State Health Department, Albany, N. Y.

There are now approximately 22,800 examination questions in the Merit System files, which have been constructed by 373 writers and reviewed by 559 persons representing the respective professional fields. The writers and reviewers are distributed geographically throughout the country to insure representative opinion and prevent overweighting with urban or eastern interests.

In coöperation with the Public Health Service, the Merit System, during the past two years, has constructed 43 examinations for surgeons, nurses, sanitary engineers, pharmacists, and dietitians in the Division of Commissioned Officers. Promotional examinations for surgeons and nurses are now in the planning stage, as are entrance examinations for veterinarians, dentists, psychologists, and twenty other scientific specialties.

A.P.H.A. membership application blank on page LIII

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

POSITIONS AVAILABLE

Sanitarian for City-County Health Department. Generalized program. State qualifications and salary expected. Travel allowance 8¢ a mile. Retirement plan, sick leave, vacation. Write: City-County Health Dept., Safety Bldg., Eau Claire, Wisc.

Two Staff Nurses for generalized Public Health Nursing Program adjacent Washington, D. C. Three weeks paid vacation, sick leave, 40 hour week, merit salary increases, opportunity to attend universities part time in Washington. Must own car. Write: Personnel Director, Arlington Court House, Arlington, Va.

Physician Public Health Officer—A limited number of vacancies for Public Health Officers with Military Government in Japan are open. These involve supervision of Japanese Prefecture (State) Health Departments in all phases of public health programs. Excellent opportunity for broad experience in public health under two year contract, renewable if desired. Salary $6,858, free housing for health officer and family plus free transportation to and from Japan. For details and application form write: Chief, Public Health and Welfare Section, GHQ, SCAP, APO 500, % Postmaster, San Francisco, Calif.

Health Officers for positions in State District Offices. Excellent retirement system and Civil Service. Write: Roland R. Cross, M.D., Director, State Department of Public Health, Springfield, Ill.

Dentist—Full-time, to serve as dental clinician in a rural school dental health program. Salary $5,000 per annum. Appointee will operate a modern, well equipped mobile dental unit. Write: S. D. Sturkie, M.D., Director, Joint Health Department, Charlottesville, Va.

Educational Director for voluntary nursing agency, generalized program; undergraduate and graduate students accepted for field experience; interesting opportunity for beginner in educational field. B.S. degree and supervisory experience required. Write: **Box A-51,** Employment Service, A.P.H.A.

Dentist for Children's Operative Clinics in the Cincinnati Schools, half-time, five days per week. Minimum annual salary full-time, $3,954, maximum, $4,754; vacation with pay; sick leave and retirement; license to practise in Ohio necessary. Write: Dr. E. H. Jones, 530 Provident Bank Bldg., Cincinnati, Ohio.

Supervising Public Health Nurse, present salary range $291.75 to $361.75 plus car allowance; automatic increases; cost-of-living salary adjustments semi-annually. Application for examination may be obtained by writing to: Personnel Division, City Hall, Madison 3, Wisc.

Assistant Health Officer. Opportunity for young physician in large county; generalized program with emphasis on tuberculosis control. Previous experience and training desirable but not essential. Salary $7,000 to $7,500 plus car allowance and official expenses. Write: **Box A-52,** Employment Service, A.P.H.A.

Public Health Nurses for a well established, generalized program, including school health, in a partly rural California county with a population of about 65,000. Present salaries: Junior grade, $2,640–$3,216; Senior grade, $2,916–$3,540. Probable general increase soon. Car needed; travel allowance 6¢ per mile; vacation, sick leave, all legal holidays, 38 hour week, merit system being established. Write: Health Officer, Box 360, San Luis Obispo, Calif.

Director of Health Education, in a rural and urban County Health Department adjacent to Washington, D. C. To conduct a broad and general Public Health Program in close integration with voluntary health organizations. Write: Montgomery County Civil Service Commissioner, Old Court House Bldg., Rockville, Md.

Chief Medical Officer: Extensive, diversified, well established medical, public health and sanitation two-government cooperative program in urban and rural

areas in Bolivia, requires licensed physician with graduate training plus a minimum of 5 years' full-time experience in public health work. Age, under 60. Married or single. Total remuneration range $10,518 to $13,761 per annum. Minimum desirable period service 2 years. English speaking colleagues. Transportation provided for employee and dependents. Write: Director, Health and Sanitation Division, Institute of Inter-American Affairs, 499 Pennsylvania Ave., Washington 25, D. C.

Physician as Director City-County Health Department, population 56,000; staff of 14; ideal offices and laboratory. Salary for man with degree in public health $9,000 plus 8¢ per mile travel. Write: City-County Health Department, Safety Bldg., Eau Claire, Wisc.

Tuberculosis Control Director for State Department of Health; salary range $6,480–7,440. Some administrative experience in Tb Control work required, also graduation from an approved school of medicine; one year internship; eligibility for an Arizona license and two years' experience in public health work or graduate study in public health. Write: J. P. Ward, M.D., Director, State Dept. of Health, Phoenix, Ariz.

Public Health Nurse: For generalized program including school service. Staff of 40 nurses. Completion of accredited course in public health nursing required. County car or 7¢ per mile for personal car. Beginning salary $2,940 per annum. Merit system, five day week, good personnel policies.

Physician: Training and experience in Public Health required. County car or 7¢ per mile for personal car. Beginning salary $5,700 per annum, maximum salary $7,140. Merit system, 40 hour week, good personnel policies.

Public Health Laboratory Technician: Opening in a modern, well equipped laboratory requiring professional training and experience. Staff of 12 technicians under direction of M.D. Entrance salary $3,540 per annum. Merit system, 40 hour week, good personnel policies.

Write: (three above positions) Kern County Personnel Department, Rm. 108 Court House, Bakersfield, Calif.

Food Sanitarian for large County Health Department, both rural and urban population of approximately 130,000. Should have B.S. in biological science or chemistry, as well as one year's experience in food sanitation with a full-time local health department. Salary $3,600. Must have car, mileage reimbursed on a sliding scale. Write: Director, Will County Health Department, 21 E. Van Buren St., Joliet, Ill. Include snapshot and short history in first letter.

Public Health Staff Nurses—Beginning salary $2,760 plus $900 maximum travel allowance. Consideration will be given for training and experience. Liberal vacation and sick leave. Ottawa County is located near a large city with many cultural interests and opportunities for advanced education. Population both rural and urban approximately 70,000. Write: Director, Ottawa County Health Department, Court House, Grand Haven, Mich.

Assistant Sanitarian for city and county generalized program with emphasis on food and milk sanitation. Degree, training and experience required. Beginning salary $3,000 or more according to experience plus $900 maximum travel allowance. Retirement plan, sick leave and liberal vacation. Write: Director, Ottawa County Health Department, Court House, Grand Haven, Mich.

Supervising Public Health Nurse for modern generalized nursing program. Minimum requirements, public health certificate or one year of graduate study in public health nursing. Salary range $278 to $318; 40 hour week; retirement plan; sick leave. Write: Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

Public Health Nurses for generalized nursing program, salary range $265–$285 per month; 40 hour week; vacation and sick leave; car furnished. Write: Director of Public Health Nursing, 504 County-City Bldg., Seattle 4, Wash.

Public Health Engineer or experienced and well trained Sanitarian to plan and conduct a municipal program in Public Health Sanitation, with emphasis on insect, food and milk control, in city of about 15,000. Prefer resident of southeastern states. Write: Box 146, Hartsville, S. C., Commissioner of Health.

Dentist to operate a mobile dental unit in rural sections. Opening available May 1. Starting salary $4,500 plus liberal travelling allowance. Write **Box A-53**, Employment Service, A.P.H.A.

Health Educator for Department of Public Health and Preventive Medicine at western medical school. Rank of Instructor or Assistant Professor. M.P.H. or Master's Degree in Public Health Education and at least 5 years' experience required, preferably including teaching experience. Duties will consist mainly of teaching and consultation. Write **Box A-54**, Employment Service, A.P.H.A.

Announcements

United States Civil Service Commission, Washington, D. C.

Examination for Industrial Hygienist

Applications are now being accepted for an Industrial Hygienist examination which has been announced to fill positions in various field activities of the Navy Department, and in other federal agencies, in Washington, D. C., and throughout the United States. Salaries range from $3,727 to $6,235 a year.

For further information see Announcement No. 4-34-1 (1949) at any first- or second-class post office, where the necessary application forms may also be obtained. Applications will be accepted until further notice, and must be filed with the Executive Secretary, Boa.'d of U. S. Civil Service Examiners for Scientific and Technical Personnel of the Potomac River Naval Command, Bldg. 37, Naval Research Laboratory, Washington 25, D. C.

California State Personnel Board

Examinations for Assistant Sanitary Engineer and Associate Sanitary Engineer

The California State Personnel Board announces nation-wide examinations for Assistant Sanitary Engineer and Associate Sanitary Engineer for May 21, 1949. Positions will be available with the Bureau of Sanitary Engineering of the California Department of Public Health. At least two years of sanitary engineering experience and graduation from college in sanitary or public health engineering is required. Salary for the Assistant Sanitary Engineer is $341 to $415 a month; for the Associate Sanitary Engineer, $415 to $505 a month.

Applications for the May examination must be filed on or prior to April 30, 1949. Address inquiries to: Recruitment Section, California State Personnel Board, 107 State Building, San Francisco 2, Calif.

United States Public Health Service

Regular Corps Examination for Medical Officers

A competitive examination for appointment of Medical Officers in the Regular Corps of the U. S. Public Health Service will be held on May 3, 4, and 5, 1949, at various points throughout the United States.

Appointments are permanent in nature and provide opportunities for a lifetime career in clinical medicine, research, and public health at Marine Hospitals and other Public Health Service facilities.

Appointments will be made in the grades of Assistant Surgeon (1st Lt.) and Senior Assistant Surgeon (Captain). Entrance pay for an Assistant Surgeon with dependents is $5,011 a year; for Senior Assistant Surgeon $5,689. Provisions are made for promotions at regular intervals up to and including the grade of Senior Surgeon (Lt. Colonel) and for selection for promotion to the grade of Medical Director (Colonel) at $9,751 per annum. All applicants must be United States citizens of at least 21 years of age, and possess a diploma of graduation from a recognized school of medicine.

Additional information and application forms may be obtained by writing to the: Surgeon General, U. S. Public Health Service, Washington 25, D. C., Division of Commissioned Officers. Completed applications must be received by April 14, 1949.

POSITIONS WANTED

Medical Administrator — experienced county health officer, M.P.H. (Columbia), age 38, wants more responsible position with larger salary, as director county or city unit, or voluntary agency. Previous training and experience in hospitals, private practice, army preventive medicine, industry. Write: **Box C-10**, Employment Service, A.P.H.A.

Health Educator—M.P.H., male, single. 19 years of formal education including half year study of public health in Sweden. Army experience in environmental and personal hygiene, counseling, communicable diseases. Basic teaching and A.P.H.A. field work requirements satisfied. Interested in school and public health education, mental health and alcoholism. Write: **Box HE-11**, Employment Service, A.P.H.A.

Sanitary Engineer, B.S. M.C.E. 35 years; 12 years experience including work in large eastern city health department; Corps of Engineers, Sanitary Corps, U. S. Army; Sanitary Engineer in charge in large federal agency. Design and opera-

tion experience in all phases. Professional Engineering license, New York State. Write: **Box E-8**, Employment Service, A.P.H.A.

Sanitary Engineer, B.S. in Chemistry; age 30; 5 years field experience in sanitary engineering; 4 years office design experience. Interested in position in public health as sanitary engineer involving responsibility with industry or official agency. Write: **Box E-9**, Employment Service, A.P.H.A.

Veterinarian, 26, single, M.P.H. (Michigan) advanced work in bacteriology and parasitology; experience in animal disease control, milk and food sanitation, private practice. Interested in position in official agency, industry or laboratory in the United States or overseas. Write **Box V-7**, Employment Service, A.P.H.A.

Industrial Hygienist, M.S. in industrial hygiene expected in May including training in engineering and laboratory technics and occupational disease aspects of industrial hygiene. Experience (one year) in environmental sanitation program in metropolitan health department. Write **Box I-H-2**, Employment Service, A.P.H.A.

Bacteriologist—Ph.D. (June, 1949). Interested in academic, industrial, or public health opening preferably in the Northeast. Three years research on quaternary ammonium germicides. Age 28, married, veteran. Write: **Box LD-3**, Employment Service, A.P.H.A.

Dentist, male, 30 years old, M.P.H. expected in June; 5 years experience clinical and public health experience (civilian and in U. S. Army). Interested in administrative or part-time clinical opening in U. S. or overseas. Write: **Box D-4**, Employment Service, A.P.H.A.

Annual Service Plan for Public Health Examinations

A quarter of the states of the Union are now members of the Annual Service Plan of the Merit System Service and the first county (Nassau County, New York) joined in March. The states are: Colorado, Idaho, Illinois, Kentucky, Maine, Maryland, Mississippi, New Hampshire, New Jersey, North Dakota, Oklahoma, and Vermont.

Under this plan, which was initiated in 1948 and has been approved by the Public Health Service, the Children's Bureau, and the Executive Board of the Association, and has been heartily endorsed by the Association of State and Territorial Health Officers, an unlimited number of standard examinations are provided to an agency at an annual service fee including all positions for which the Merit System Service has such examinations available. New subject-matter areas are constantly being added as need arises. Other benefits in terms of aids in personnel administration go to members of the plan, and it is expected that many of the 37 states which have already used the Service will join the plan by July 1.

Information regarding the benefits of joining the plan and the cost may be secured from the Merit System Service.

The plan is also open to municipal and county civil service agencies.

Advertisement

All communications should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

Opportunities Available

WANTED—(a) Public health physician to direct well established program, South American country: English speaking colleagues; $10,000–$13,000, transportation for self, dependents. (b) Dentist experienced in public health dentistry; regional consultant position; South. (c) Public health physician to direct division of geriatrics and adult hygiene; metropolitan health department. (d) Professor of preventive medicine; should be qualified to teach preventive medicine and public health with a primary emphasis on preventive medical aspects; East. (e) Woman physician to direct student health program; approximately 1,000 women students and faculty members; $5,000, maintenance. (f) Director, maternal and child health and crippled children's services; state health department; West. (g) Student health physician; liberal arts college; California. (h) Director, city-county health department; staff of fourteen; town of 45,000; Middle West. **PH4-1** Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

WANTED—(a) Coördinator of training; state health department; Master's desirable; $5,000. (b) Sanitary engineers, public health engineers, and specialists in fields of malaria and insect control; positions of considerable responsibility; South America. (c) Health educator; state division of national organization; New England. (d) Sanitary chemist; qualified to conduct lake pollution investigation; laboratories of state university; Middle West. (e) Public health engineer; state department; Middle West. (f) Health educator to join faculty, university department of health; rank: instructorship ($4,200–$5,000) or assistant professor ($4,800–$5,600). **PH4-2** Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

WANTED—(a) Director; newly established visiting nurse association; vicinity New York City; $4,000. (b) Director of public health nursing; state department; headquarters in college town; West; $4,800. (c) Educational director; visiting nurse service; South. (d) Assistant professor of public health nursing; eastern university. (e) Maternal and child health nursing consultant; West; $4,000. (f) Supervisors and staff nurses; newly established city-county health department; Middle West. (g) Supervisor; generalized program, including tuberculosis division, school program; university town, California. (h) Supervisor; nursing staff, municipal health department, Chicago area; $4,500. (i) Supervisor of nurses; public school system; 16,000 children; staff of fourteen nurses; Middle West. **PH4-3** Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Advertisement

Opportunities Wanted

Public health physician; Master's in Public Health, eight years, administrative health officer, principally in rural areas; five years, director, metropolitan health department; for further information please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health dentist; D.D.S., M.S.D. (Children's Dentistry), M.P.H. (Public Health); several years, teaching experience; for further information please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Sanitary engineer; M.S. (Sanitary Engineering); eleven years, Division of Industrial Health, state department of health, five years as assistant director and six as director; for further information please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Health Educator; M.P.H., Harvard; four years, statistician; eight years, health educator, state health department; for further information please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health nurse; B.S. (Public Health Nursing); four years, school nurse; seven years, supervisor, metropolitan health department; for further information please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

THE AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH, INC. DIGEST OF REQUIREMENTS FOR CERTIFICATION OF PHYSICIANS

As previously announced in the *American Journal of Public Health* (March, 1949, p. 426), the American Board of Preventive Medicine and Public Health, Inc., has been set up, with representation from the American Medical Association, the American Public Health Association, the Canadian Public Health Association, the Southern Medical Association, and the Association of Schools of Public Health.

The Board was created in accordance with action of the Advisory Board for Medical Specialties and was approved by the Council on Medical Education and Hospitals of the American Medical Association in February, 1949. The principal purposes of the Board as defined in the articles of incorporation are:

1. To encourage the study, improve the practice, elevate the standards, and advance the cause of preventive medicine and public health.
2. To grant and issue to physicians duly licensed by law to practise medicine Certificates of special knowledge in preventive medicine and public health.

Requirements for Certification

General Qualifications

1. Moral and ethical standing in the profession satisfactory to the Board.
2. Graduation from a medical school in the United States or Canada approved by the Council on Medical Education and Hospitals of the American Medical Association, or from a foreign medical school satisfactory to the Board.
3. An interneship of at least one year in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association or in a foreign hospital satisfactory to the Board.
4. Licensure to practise medicine in the United States or the Dominion of Canada.
5. Special training in preventive medicine or public health which shall include:
   A. A period after interneship of not less than six years of special training, teaching, or practice in preventive medicine and public health which must include B and C.
   B. Successful completion of at least one academic year of graduate study leading to the degree of Master of Public Health, or an equivalent degree or diploma, or an equivalent satisfactory to the Board.
   C. Field training or residency of at least two years of field experience in general public health practice, which included planned instruction, observation and active participation in a comprehensive, organized, public health program, one year of which may be an approved clinical residency in a field directly related to public health.
6. Limitation of practice to teaching or practice of preventive medicine or public health as a specialty.

The Founders Group

The By-Laws authorize the Board for a period of time ending July 1, 1950, to excuse from examination practitioners of preventive medicine or public health who have attained unquestioned eminence in the field.

Examinations

Examinations will be held from time to time and in various places depending upon need as indicated by applications received. It is expected that examinations will be held primarily in connection with the meetings of the American Public Health Association. The examination will consist of two parts:

Part one to consist of a comprehensive written examination designed to test the knowledge of the applicant in the general field of preventive medicine and public health. These examinations will

be announced at least sixty days prior to the holding of the examinations. The written examination will be confined to one day. Part two to consist of the oral or practical examination which will be held on the day following the written examination. This examination will be held before two to four examiners, members of the Board or associate examiners. An endeavor will be made to adapt the details of the oral examination to each candidate's experience and practice. The examiners will report orally upon each candidate to the assembled Board, after which the results of the examination will be considered jointly by the entire Board and the examiners. Final action of the Board will be based upon the candidate's ethical and professional record, training, and attainments as well as on the results of his formal examination.

Applications

Applications which must be on prescribed application forms are to be filed with the Secretary not less than 90 days prior to the date of examination.

Fees

The Board is incorporated as a non-profit corporation and no member of the Board may receive any compensation. Minimum fees are specified, consistent with the cost of examination and certification. The total cost to the applicant is $50.00.

Application fee $15.00

No application can be considered for classification and action by the eligibility committee unless accompanied by the application fee. The application fee is not refundable.

Certification fee $35.00

This fee is payable when the candidate is notified of acceptance for examination or as a member of the Founder's Group. It is not returnable after the candidate has been officially accepted and notified by the eligibility committee to report for examination.

Certification

Upon satisfactory completion of the examinations or, in the case of the Founder's Group, upon the affirmative vote of the Board, a certificate will be issued to the effect that the person named has been found to be possessed of special knowledge in preventive medicine and public health. This certificate will be signed by the officers of the Board and shall have its seal affixed. Each certificate shall remain the property of the corporation, but each person to whom a certificate is issued shall be entitled to its possession until revoked. Any certificate issued by the Board may be revoked if evidence, satisfactory to the Board, is presented that the applicant was not eligible at the time of application, or made any missstatement or misrepresentation of facts or that his license to practise medicine has been suspended or revoked.

Persons desiring further information should communicate with the Secretary of the Board, Dr. Ernest L. Stebbins, 615 N. Wolfe Street, Baltimore, Md.

NOTE: Applications to be considered by the American Board of Preventive Medicine and Public Health close 90 days before the announced dates of the examination instead of 60 days as stated in the news item, page 426, *A.J.P.H.*, March, 1949.

AMA OFFERS A PUBLIC HEALTH PLAN

The American Medical Association in mid-February announced a 12 point program for the advancement of medicine and public health. In summary the points are:

1. A federal department of health of cabinet status with a physician as secretary, and coördination in this department of all federal health activities except those of the armed forces.

2. Promotion of medical research through a national science foundation with research grants to private agencies having suitable staffs and facilities.

3. Further development of voluntary hospital and medical care plans, particularly in rural areas, with state aid for including the medically indigent in such programs.

4. A state medical care authority in each state, with proper medical and consumer representation, to receive and administer funds.

5. Acceleration of development of facilities in rural areas under the Hospital Construction Act.

6. Establishment of local public health units to provide communicable disease control, vital statistics, environmental sanitation, venereal disease control, maternal and child hygiene, and public health laboratory services. Salaries to health officials commensurate with their responsibility.

7. Development of a mental hygiene program.

8. Development of health education programs through suitable state and local agencies.

9. Provision of facilities for care and rehabilitation of the aged and those with chronic diseases and other groups not presently cared for.

10. Integration of veterans' medical care with other medical care programs.

11. Greater emphasis on industrial medicine and increased safeguards against highway, home, and farm accidents.

12. Adequate support, without political interference, of medical, dental, nursing and other institutions training necessary specialized personnel for the provision and distribution of medical care.

WHO STRUCTURE

Since the World Health Organization was established as a specialized agency of the UN on September 1, 1948, its structure has been developed, and up to January, 1949, a secretariat of 255 persons were selected. Of these, 194 are in the headquarters office in Geneva, 29 in the New York Office, and 32 in the field.

The Special Assistant to the Director-General, Dr. Brock Chisholm, is Dr. W. Forrest of the United Kingdom. Dr. R. Gautier of Switzerland and Dr. N. Goodman of the United Kingdom respectively are directors of the two main departments of the headquarters office, the department of technical services, and the department of operations. The director of the division of epidemiology in the department of technical services is Dr. Y. Biraud of France.

The director of the South-East Asia regional office in Delhi is Dr. C. Mani of India. The epidemiological intelligence station in Singapore is directed by Dr. P. M. Kaul, also of India. The liaison office in New York is directed by Dr. Frank Calderone of the United States with the assistance of Dr. I. C. Fang of China.

INTERSTATE COÖPERATION IN MEDICAL EDUCATION

The presidential address of Florence Sabin, M.D., at the 1948 meeting of the Western Branch, A.P.H.A., included a reference to the possibility of interstate coöperation by the 8 Rocky Mountain and Inter-mountain States in medical and public health education. (See *A.J.P.H.*, Nov., 1948, p. 1510.)

In further exploration of such a plan there was held in Denver in December, 1948, at the invitation of the governors of Colorado, New Mexico, Utah, and Wyoming, a Mountain States Governors' Conference on Education for Health Services. In the eight Rocky Mountain and Inter-mountain states there are only two medical schools, one in Denver and the other in Salt Lake City; there is only one veterinary school, at Fort Collins, Colo., and no dental school whatever. The Conference met to consider whether under the American system of government states may find a way to coöperate in solving such a problem.

The professional schools already established are finding it difficult to procure adequate support for such expensive forms of education based on the relatively sparse populations of the western states. The states without professional schools find it hard to place their students because the cost of such education is far beyond the tuition charged. For example, medical education costs about $3,000 per student per year.

State constitutions do not permit the allotting of funds for an institution in another state. Therefore, Dr. Ward

Darley, Director of the University of Colorado Medical Center, offered for discussion a plan whereby states without professional schools might grant to their own universities funds to be used by them to pay the full cost of medical education (in the widest sense) for their own students, selected by them with the advice of a member of the admissions committee of a university maintaining a professional school.

The legal implications of this proposal are now being explored as well as the further point as to whether it is necessary to secure a federal enabling act.

NEW MEN ON MEDICAL AID TO CHINA BOARD

Ten new members were recently elected to the 70 man board of directors of the American Bureau for Medical Aid to China. They are Drs.:

Ira V. Hiscock, Chairman, Yale University Department of Public Health

P. Z. King, Chief Medical Advisor, United Nations' International Children's Emergency Fund and former Chinese Vice Minister of Health

H. Dabney Kerr, head, Department of Radiology, University of Iowa, former roentgenologist, Peking Union Medical College

John McK. Mitchell, Dean, University of Pennsylvania Medical School, Executive Officer, 20th General Hospital, Assam, in World War II

J. Howard Mueller, Professor of Bacteriology and Immunology, Harvard Medical School

Wade W. Oliver, Associate Director, Medical Sciences, Rockefeller Foundation

Walter S. Root, Professor of Physiology, College of Physicians and Surgeons, Columbia University

Douglas H. Sprunt, University of Tennessee Institute of Pathology

Ernest L. Stebbins, Director, Johns Hopkins School of Hygiene and Public Health

A. A. Weech, Medical Director, Children's Hospital, Cincinnati, former head, Pediatrics, Peking Union Medical College

FIRST HILL BURTON HEALTH CENTER

The first of 63 public health centers in the United States approved to date for federal aid under the national hospital program was dedicated and opened to the public in Birmingham, Ala., January 27. The building will house offices of the Jefferson County Board of Health, Alabama state laboratories and voluntary agencies, such as the local branches of the tuberculosis association, the American Cancer Society, the National Foundation for Infantile Paralysis, and Visiting Nurses Association.

ARCTIC HEALTH INSTITUTE PROPOSED FOR ALASKA

A resolution was recently introduced into the U. S. Congress requesting a $7,775,000 appropriation for construction in Alaska of an Arctic Health Institute to be located in connection with the University of Alaska at Fairbanks.

The proposed institute is designed for research in all phases of medicine and biology relating to maintenance of health in Arctic and Sub-Arctic Regions. Such problems as the adaptation of housing design and materials for economical use in areas of prolonged low temperature, the development of effective and practical methods for providing safe water supplies at sub-zero temperatures, and methods of safe disposal of human wastes in permafrost areas where ground is permanently frozen during the greater part of the year will be included.

According to the announcement of the Alaska Department of Health, the program of research in Arctic health problems is now under way under the auspices of the recently established U. S. Public Health Service Field Station at Anchorage where studies are planned in the fields of physiology, bacteriology, nutrition, sanitation, and animal diseases.

FELLOWSHIPS IN COMMUNITY NUTRITION

The College of Home Economics of

the University of Tennessee offers several graduate fellowships in Community Nutrition, covering tuition and a stipend of $1,200 for a 12 month period. The program trains candidates for positions as nutritionists with health and welfare agencies and leads to the degree of Master of Science in Community Nutrition. Three quarters of work in residence at the university and one quarter of supervised field work in a health agency are required.

Candidates must have a baccalaureate degree in home economics with a major in foods and nutrition, or its equivalent, and 2 years of experience in teaching, extension work, Farmers Home Agency work, hospital or other food service, or equivalent. Interests and ability of the candidate are further considerations in accepting students for training.

Application blanks and further information may be obtained from the College of Home Economics, the University of Tennessee, Knoxville.

AGE AND DIET

The National Dairy Council has made available reprints of two articles dealing with nutrition as it affects later life. Reprinted from the *Journal of the American Dietetic Association*, they are: Nutritional Status of Older Women, and Dietary Practices of 100 Women 40 to 75 Years of Age. They are the reports of a research project carried on at Michigan State College with the support of the National Dairy Council.

These reprints are available from the National Dairy Council, 111 North Canal St., Chicago 6.

FEDERAL HEALTH GRANTS, CANADA AND THE UNITED STATES

The Canadian National Government appropriates about twice as much for local health services as the United States Government. This is the conclusion of an article, illustrated with pictographs, in the September issue of *Canada's Health & Welfare*.

Of 8 separate areas of health, for only 3 are the Canadian per capita federal grants to provinces less than the United States grants to states—venereal disease, crippled children, and public health research. In all others including general public health, the per capita grants are from 2 to 16 times as large. The greatest discrepancy is in mental health activities where the United States grants to states average 2 cents per capita, those of Canada to the provinces 32 cents.

NATIONAL ADVISORY HEALTH COUNCIL

The current members of the National Advisory Health Council, an advisory body to the U. S. Public Health Service, are as follows:

Term expiring 1949

Ernest E. Irons, M.D., Professor of Medicine, University of Illinois Medical School

William C. Rose, Ph.D., Professor of Chemistry, University of Illinois

Term expiring 1950

Edwin B. Fred, Ph.D., President, University of Wisconsin

Karl F. Meyer, M.D., Director, Hooper Foundation for Medical Research, University of California, San Francisco

Term expiring 1951

George Baehr, M.D., President, Medical Board, Mt. Sinai Hospital, New York

Francis G. Blake, M.D., Sterling Professor of Medicine, Yale Medical School

Term expiring 1952

Reuben G. Gustavson, Ph.D., President, University of Nebraska

Hugh Morgan, M.D., Professor of Medicine, Vanderbilt University

Term expiring 1954

Wilton L. Halverson, M.D., Director, California State Department of Public Health

Thorndike Saville, D.Eng., Dean, College of Engineering, New York University

The four ex-officio members are:

Captain W. Babione (M.C.), U.S.N., Director, Preventive Medicine Division, Navy Department

Assistant Surgeon General R. E. Dyer,

Director, National Institutes of Health
Col. Don Longfellow, M.C., U.S.A., Chief, Preventive Medicine Division, Department of the Army
Harry W. Schoening, Assistant Chief, Bureau of Animal Industry, U. S. Department of Agriculture

LABORATORY IN GROUP DEVELOPMENT

The National Training Laboratory in Group Development will hold its third summer session at Gould Academy, Bethel, Me., June 19–July 8, 1949. The Laboratory is sponsored by the Division of Adult Education Services of the National Education Association and the Research Center for Group Dynamics of the University of Michigan, and with the coöperation of certain other universities. The Laboratory provides opportunity for action leaders, trainers, educators, and social scientists to explore, in a laboratory situation, basic concepts and skills of group growth and group leadership and membership. Further information from Leland P. Bradford, Director, Division of Adult Education Services, NEA, 1201 Sixteenth Street, N.W., Washington 6, D. C.

CLAIR E. TURNER TO IRAN

Clair E. Turner, Dr.P.H., Assistant to the President of the National Foundation for Infantile Paralysis, with a group of specialists in other fields, is making a Public Health Survey in Iran. These experts were sent to Iran by Overseas Consultants under a contract with the Iranian Government.

LEBANON'S FIRST PUBLIC HEALTH EXHIBIT

The American University in Beirut recently initiated an annual Health Week in Lebanon. One of its features was the first public health exhibit ever seen in Lebanon. The exhibit consisted of 40 large panels showing the way disease germs are transmitted. The exhibit was based on the vital need for an enlarged program of public education about the ways through which a healthy body becomes diseased. This need was reported after a sanitary survey of conditions made by a graduate of the University Medical School, Dr. Zeken Shakhashiri, who is now studying at the Johns Hopkins Medical School.

Another aspect of the growing interest in public health was the recent organization of the Lebanese Public Health Association.

CANCER FILM TEACHING "PACKAGE"

A motion picture teaching film, "Cancer: The Problem of Early Diagnosis," is the first in a series of six planned for the next two years for professional audiences. Produced by Audio Productions under the joint sponsorship of the American Cancer Society and the National Cancer Institute, it emphasizes the importance that early suspicion, accurate diagnosis, and effective treatment hold in cancer control.

Prints for single showings may be had from state cancer society officers and state health departments. The film may be purchased for $150 from Audio Productions Inc., 630 Ninth Avenue, New York 19.

BIBLIOGRAPHY ON PLUMBING AND PUBLIC HEALTH

The U. S. Public Health Service has recently made available a revised bibliography on, *Plumbing and Public Health*. It includes items up to July 1, 1948 and replaces the previous bibliography published in 1940. Copies may be obtained from the U. S. Public Health Service, Division of Sanitation, Washington, D. C.

A.M.A. RURAL HEALTH CONFERENCE

The 4th annual rural health conference of the American Medical Association in Chicago on February 4 and 5 was attended by nearly 500 persons, representing farm organizations, state

and federal extension services, agricultural colleges, and allied health agencies. Papers and round table discussions were related to five sections—coöperative health programs for rural areas, environmental hazards, health education, individual and community responsibility, the general practitioner in rural practice, and nutrition and the soil.

The first section recommended that the National Conference on Rural Health go on record as urging that every local area establish a voluntary overall coördinating health agency such as a health council or health committee.

It further recommended complete coverage of the nation with full-time local health units in the belief that this is fundamental to the effective functioning of all health programs.

One of the primary objectives of a health council may well be the attainment of local health units where they do not exist and the strengthening of existing ones.

This section was in agreement with the present efforts of state and territorial health officers, the National Congress of Parents and Teachers, and many other national organizations in supporting, in principle, legislation designed to attain the objectives of full-time local health units coverage for the nation.

The entire Conference adopted an 11 point program of coördination and utilization of existing lay and professional facilities through the following media:

"(1) State and public health services for general community hygiene and communicable disease control; public health nursing, well-baby conferences and clinics.

"(2) The Hill-Burton Hospital Construction Act operating where a community desires such facilities.

"(3) Medical scholarships provided by medical associations, farm bureaus and through legislative appropriations for medical and nursing education to candidates agreeing to practice in rural areas.

"(4) Agricultural school extension services for health education.

"(5) Parent-teacher associations where they encourage school children examinations for hearing, sight, heart, hernia, immunization, school hygiene, as well as physical education.

"(6) Special health groups such as tuberculosis, polio, cancer, heart.

"(7) The application of voluntary prepaid medical and hospital care plans to rural communities.

"(8) Promotion of state and county health councils, the medical profession acting cooperatively with other groups for health education and health activities of local character.

"(9) A plan to bring the medically indigent, or low income, farmer into voluntary prepaid medical plans, which may involve state financial aid.

"(10) Use of the health education programs of farm groups.

"(11) Encouragement of the civilian population, as distinguished from governmental official action, to help itself."

MINNESOTA NUTRITION COUNCIL SEEKS TO CONTINUE FLOUR ENRICHMENT

The Minnesota State Nutrition Council is actively supporting the passage of a bill in the State Legislature to require the enrichment of flour and bread sold within the state in accordance with the standards established by the Federal War Emergency Legislation. Mrs. F. N. Christofferson is Co-Chairman of the Legislative Committee of the Minnesota State Nutrition Council, St. Paul, and Mrs. Helen E. Hughes is Corresponding Secretary.

The American Public Health Association's Governing Council declared October 4, 1944 (*A.J.P.H.*, Dec. 1944, page 1298) that the enrichment of staple food stuffs during the war through federal, state, and voluntary action has resulted in an improvement in the national dietary with respect to several highly essential nutrient elements. The Governing Council pointed out that this enrichment in staple low cost foods has been of proportionately greater benefit to the economic groups whose diet is most in need of betterment.

The Association formally went on rec-

ord as favoring appropriate state and federal action to perpetuate the benefits that have accrued to the national dietary through enrichment of staple foods in accordance with the recommendations of the National Research Council.

ROYAL SANITARY INSTITUTE ISSUES YEAR BOOK

The 1949 *Year Book of The Royal Sanitary Institute,* London, consists of a list of Honorary Fellows, Fellows, members, and associates. A summary follows with a comparative column for the American Public Health Association:

Royal Sanitary Institute	
Honorary Fellows	23
Fellows	642
Members	4,175
Associates	3,174
Total	8,014

American Public Health Association	
Honorary Fellows	22
Fellows	2,093
Members	8,987
Total	11,102

ARGENTINE GROUP ELECTS OFFICERS

The Sociedad Argentina de Patología Infecciosa y Epidemiología of Buenos Aires has announced that the following officers will serve during 1949:

President—Dr. Humberto R. Rugiero
Vice-President—Dr. Lucio A. Garcia
Secretary—Dr. Enrique Callegari
Executive Secretary—Dr. Teodoro Somaloma
Treasurer—Dr. Alfredo Igobone

MISSOURI RIVER BASIN HEALTH COUNCIL ORGANIZED

On July 15, 1948, the health officers of the 10 states in the Missouri River Basin: Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota and Wyoming, signed "The Missouri River Basin Sanitation Agreement." Under the agreement, a permanent Missouri River Basin Health Council composed of the health officer and sanitary engineer of each of the respective states was formed.

The following officers were elected:

Chairman—W. S. Petty, M.D., Nebraska State Health Officer
Vice Chairman—J. L. Williams, Jr., M.D., Missouri Acting State Health Officer
Secretary—W. W. Towne, Director, Division of Sanitary Engineering, South Dakota Board of Health

The purpose of the Council has been stated as: ". . . to coöperate with the U. S. Public Health Service and other agencies involved in carrying out a policy for the protection and improvement of the water of this Basin wherever necessary in these states, and the prevention or correction of undue pollution thereof, and in the promotion of specific health programs relative thereto, to the end that full development of the said Basin with its many benefits may be realized by all the people residing in the area."

One of the first committees appointed was the Engineering Committee, composed of the sanitary engineering directors of the 10 states. At a meeting of this committee on December 3 and 4, subcommittees were appointed to study the following subjects:

1. Water standards and classifications
2. Uniform legislation, compacts, etc.
3. Uniform standards for submission of plans, methods and reporting of data, and mapping
4. The scope of environmental sanitation problems in the basin and recommendations for further committee action.

INCREASED HOSPITAL SERVICE RATES

Increased rates effective May, 1949, have been announced by the Associated Hospital Service of New York. This is the second increase in rates during the 14 years of the organization's existence, the first having been in May, 1947. The new rates represent approximately 27 per cent increase over the

previous ones and about 80 per cent over the original ones established in 1935. In the 2 years since the first increase in subscription rates hospital costs are estimated to have increased by 35 per cent.

PILOT MENTAL HEALTH PROJECT

The Division of Mental Hygiene of the U. S. Public Health Service, in coöperation with the Arizona State Department of Health, has established a pilot project in Phoenix, Ariz., designed to develop and strengthen community resources for mental health. Personnel will help mental health training, and consultation staffs of well baby and prenatal clinics, nursery and elementary schools, and health and welfare agencies deal with emotionally disturbed persons in such a way as to obviate the need for psychiatric treatment. The U. S. Public Health Service has assigned Walter M. White, Jr., M.D., psychiatrist, a clinical psychologist, two psychiatric social workers, and one mental health nurse to this project.

HEALTH IN RETARDED AREAS AID PLAN

The blueprints for help to economically backward areas of the world as outlined recently by President Truman stress the integration of the special technical missions that will be sent to various parts of the world. Thus agricultural plans will be supplemented by transportation plans, health programs by educational and agricultural, etc., around the circle of interrelated factors in raising the levels of production and standards of living in underdeveloped regions.

In such a plan, for example, plans for the reduction of infant mortality would go hand in hand with nutrition and food programs, so that there would not be the spectacle of saving babies to die of starvation as children or adolescents. Malaria would be controlled not only as an end in itself, but to produce sufficiently energetic workers to contribute their share to the national economy.

MASSACHUSETTS HEALTH CONFERENCE

The first annual Massachusetts Health Conference was held in Boston on February 19 and 20, under the chairmanship of Philip Mather, President of the National Health Council and of the American Social Hygiene Association. The program included 20 panel sessions on as many health subjects. Among these with their chairmen were:

Medical Care Costs and Methods—Hugh R. Leavell, M.D.

Local Health Units and Health Centers—Robert E. Archibald, M.D.

Citizen Participation in Planning for Health—Margaret Tracy

Rural Health Problems—Jesse Buffum

The Massachusetts Health Conference is made up of some 80 members representing every variety of citizen and professional interest in health in Massachusetts.

REGIONAL CONFERENCES ON LOCAL HEALTH UNITS IN GREAT PLAINS AREA

The National Advisory Committee on Local Health Units of the National Health Council has planned the 3rd and 4th in a series of regional conferences on local health units. The two conferences currently planned are one in Kansas City, Mo., April 20–21, to include Arkansas, Kansas, Louisiana, Missouri, and Oklahoma; and a second in Omaha, Nebraska, April 25–27, to include Iowa, Minnesota, Nebraska, North Dakota, and South Dakota.

The conferences will feature group discussions and group decisions as in the case of the two earlier conferences in Mitchell, Ind., and Salt Lake City. State teams of 10 to 15 persons, representing a cross-section of lay and professional interest in the development of more adequate local health services, will be selected by the respective state health officers.

Resource persons for the conferences will be furnished by such national agencies as the American Heart Association and the American Public Health Association, in addition to the National Health Council.

FIRE DESTROYS CHILE MEDICAL SCHOOL

Fire recently virutally destroyed the School of Medicine of the University of Chile. About 40 per cent of the library of 50,000 volumes was saved. It had just been reorganized by Edward Heiliger of the Rockefeller Foundation after 2 years' work. The journals published before 1940 and 40 per cent of those published after 1939 were saved. The extensive bibliographic material in the Institute of Biology and in the Institute of Microbiology was destroyed. The U. S. Army Medical Library is planning to supply from duplicate stocks some of the books and journals needed in the reconstruction of the Chilean collections. The American Public Health Association is sending to Dr. Hernan Romero, Director of the Laboratory of Preventive Medicine, several recent volumes of the *Journal* to restore that portion of the library. Friends of Dr. Romero who can send other journals and modern books may address them to him at the School of Public Health, University of Chile, Santa Lucia 382, Santiago.

MICHIGAN COMMUNITY CONFERENCE

The University of Michigan School of Public Health Conference on Community Health Services in Ann Arbor, January 31 and February 1, was the 30th in a series of inservice training courses held at the school within the past several years. Its nearly 100 participants were about equally divided between representatives of lay agencies and professional workers in nonofficial and official health agencies, particularly local health officers. It was designed to secure the support of an informed public for better local health units, for complete state coverage, and for a substantial state subsidy of two to three million dollars.

Out of the conference grew the beginnings of a state health committee or council. Its temporary chairman is Charles Leonard, Mayor of Hastings.

The out-of-state speakers included Florence R. Sabin, M.D., Director of Health and Welfare of Denver and Roscoe P. Kandle, Field Director of the American Public Health Association. The consumer viewpoint was presented by Mrs. E. L. Church, President of the Michigan Congress of Parents and Teachers.

CHRONIC ILLNESS COMMISSION ANNOUNCES ITS PROGRAM

As an outgrowth of the Section on Chronic Disease of the National Health Assembly held in Washington in May, 1948, a Commission on Chronic Illness is being set up as a joint project of the American Hospital Association, American Medical Association, American Public Health Association, and the American Public Welfare Association. An Interim Commission is now in operation made up of representatives of the four agencies, looking toward the formation of the permanent Commission in the near future.

The Chairman of the Interim Commission is James R. Miller, M.D., of Hartford, Conn., a member of the Board of Trustees of the A.M.A., which is also represented by Thomas A. McGoldrick, M.D., of Brooklyn, N. Y. The representatives of the American Public Health Association on the Commission are Dean W. Roberts, M.D., M.P.H., Chief of the Bureau of Medical Service, Maryland State Department of Health, Baltimore, and Edward S. Rogers, M.D., M.P.H., Dean of the School of Public Health, University of California, Berkeley.

Albert Snoke, M.D., of New Haven, Conn., and J. Douglas Colman of Baltimore, Md., represent the A.H.A., and

Ellen C. Potter, M.D., of Trenton, N. J., and Judge Thomas S. J. Waxter of Baltimore, represent the A.P.W.A. Mrs. Lucille M. Smith of the Division of Public Health Methods, U.S.P.H.S., Washington, D. C., has been detailed by the Federal Security Agency to assist the Interim Commission as Executive Secretary in establishing the permanent Commission, which will include representatives of the general public, industry, labor, agriculture, education, religion, the social sciences, journalism, and health and welfare.

The program of the Commission goes back to the joint report of the same four agencies on chronic illness (*A.J.P.H.*, October, 1947, pp. 1256–1266). It reflects the considered opinion of these agencies that the patient with chronic illness is one of the major challenges to modern society. Sooner or later some form of long-term illness affects one or more members in most families of the nation. A conservative estimate suggests that more than one-sixth of the population is afflicted with some chronic disease.

The Interim Commission has suggested the following objectives for the permanent Commission:

1. To modify the attitude of society that chronic illness is hopeless; to substitute for the prevailing over-concentration on provision of institutional care a dynamic program designed to prevent chronic illness, to minimize its disabling effects, and to restore its victims to a socially useful and economically productive place in the community.

2. To clarify the problems arising from chronic illness among all age groups, with full realization of its social as well as its medical aspects.

3. To coördinate separate programs for specific diseases with a general program designed to meet more effectively needs which are common to all the chronically ill regardless of the cause or causes of their illness.

4. To clarify the interrelationship of professional groups and agencies now working in the field.

5. To stimulate in every state and locality a well rounded program for the prevention and control of chronic diseases and for the care and rehabilitation of the chronically ill.

Proposed activities of the permanent Commission include:

1. Assembling existing data in order to evaluate and make use of all that is now available and to determine areas requiring further study.

2. Serving as a clearing house for information on laws, programs, experiments, and new developments; to keep all interested groups informed through a newsletter published regularly; and to publish special reports from time to time.

3. Stimulating the development of new methods and techniques in the organization and administration of services for the chronically ill.

4. Developing suggested patterns for integrated community programs.

5. Establishing criteria for the appraisal of state and local chronic disease programs and facilities.

6. Advising private and public state, regional, and local agencies interested in planning for the chronically ill.

7. Suggesting priorities for the determination of immediate as against long-range needs for the guidance of state and local communities.

8. Exploring methods of implementing the recommendations made by the Commission.

9. Preparing a report to the American people outlining a comprehensive plan for the prevention and control of chronic disease and for the care of rehabilitation of the chronically ill.

WHO TO ADMINISTER TWO PRIZES

The World Health Organization will henceforth administer two international prizes in public health. One is the Léon Bernard International Prize for practical results obtained in social medicine, established in 1937 in honor of Professor Léon Bernard, a member of the Health Committee of the League of Nations. The recipient will be selected by the Expert Committee on Social Medicine still to be appointed by the Health Assembly.

It will also administer the Darling Foundation International Malariology Prize to an author of an original study on the pathology or prophylaxis of Malaria. Selection of the winner will be made by the Expert Committee on Malaria. This prize fund was created in

1945 in memory of Dr. T. S. Darling, who was accidently killed during a study mission of the League of Nations Malaria Commission.

BRITISH HONOR FOR BERNARD M. BARUCH

In recognition of the international influence of his activities in advancing the cause of physical medicine, honorary membership in the British Association of Physical Medicine has been granted to Bernard M. Baruch, elder statesman and founder of the Baruch Committee on Physical Medicine. In informing Mr. Baruch of this recognition, Lord Horder, Physician to The King and President of the British Association of Physical Medicine, said "The impetus and encouragement which your generosity has afforded physical medicine is of international importance."

In 1944, Mr. Baruch established the Baruch Committee on Physical Medicine with a grant of $1,100,000 for treatment, training, and research in the field of physical medicine in which his father, Dr. Simon Baruch, was one of the nation's pioneers.

YALE SUMMER SCHOOL OF ALCOHOL STUDIES TO HAVE TWO SESSIONS

The Summer School of Alcohol Studies, conducted annually since 1943 by the Laboratory of Applied Physiology of Yale University, will hold two sessions in 1949; one on the campus of Trinity University at San Antonio, Tex., June 6–29; and one at Yale University, New Haven, Conn., July 8–August 5. The curriculum, consisting of lectures, seminars, and demonstrations, deals with the medical, psychologic, physiologic, psychiatric, sociologic, economic, legal, religious, education, and therapeutic aspects of alcohol problems. The summer school is directed by Elvin M. Jellinek, Sc.D. The lecturers, mainly from the faculties of Yale University and Texas Christian University, include authorities who have done original research in their fields as well as representatives of other national institutions of education, research, treatment or rehabilitation. Applications for the Texas session will be received up to April 1 and for the Yale session up to April 15. Application blanks may be obtained from the Executive Secretary, Summer School of Alcohol Studies, Yale University, New Haven, Conn.

PERSONALS

ODIN W. ANDERSON, Ph.D.,† has resigned as Instructor, Bureau of Public Health Economics, School of Public Health, University of Michigan, to become Associate Professor in charge of the Social Aspects of Medicine, University of Western Ontario, London, Ontario.

ROBERT J. ANDERSON, M.D.,† a former chief of the Tuberculosis Service, California State Department of Public Health, has been appointed Medical Director and Chief of the Tuberculosis Control Division, U. S. Public Health Service.

DONALD B. ARMSTRONG, M.D.,* Second Vice President of the Metropolitan Life Insurance Company, in charge of its health educational and welfare program, has been elected President of the New York Tuberculosis and Health Association, Inc.

HERBERT ARNOLD has become Assistant Sanitary Engineer in the Division of Sanitary Engineering, North Dakota State Health Department, Bismarck.

WILLIAM T. BEATY,† who for the past year has conducted a demonstration in health education with the Ulster County Health Association, joined the New York State Committee on Tuberculosis and Public Health on February 1, as Field Secretary.

JESSIE M. BIERMAN, M.D.,* Professor of Maternal and Child Health at the University of California's School of

Public Health, between January and April was in Germany to take part in a study of maternal and child health under the democratization program, at the request of the Military Government in the American Zone.

MADISON B. BROWN, M.D.,† has been appointed Executive Vice-President and Medical Director of the Roosevelt Hospital, New York City.

ELIZABETH BUTT was recently appointed Director of the Waycross branch laboratory of the Georgia State Health Department, succeeding CARL ADAMS, resigned.

A. J. CASSELMAN, M.D.,† formerly of the Public Health Laboratory of Camden, N. J., became Director of the Bureau of Laboratories, New Jersey State Department of Health.

DUNCAN M. CHALMERS, M.D., has succeeded LEO J. GEHRIG, M.D., as Director, Division of Tuberculosis Control, Alaska Department of Health. He has been chief of the outpatient department and station allergist with the Veterans Administration at Batavia, N. Y.

EDWARD J. CLEARY, has resigned as Executive Editor of "Engineering News-Record," to become Executive Director and Chief Engineer of the Ohio River Valley Water Sanitation Commission. From headquarters in Cincinnati, he will direct the work on stream pollution abatement envisaged in the compact signed a year ago by the governors of the 8 states of the Ohio River Basin.

JAMES S. CULLEYFORD, M.D., Chief of Medical Services, Veterans Administration, Regional Office, Denver, Colo., has been decorated with the Order of the Orange-Nassau with Swords by the Netherlands Government for his outstanding services to Dutch people held in German concentration camps during the recent war.

LOUIS K. DIAMOND, M.D., of the Harvard Medical School and Children's Medical Center, Boston, has been granted temporary leave to serve as Medical Director of the National Blood Program, American National Red Cross, Washington, D. C.

HARRY EAGLE, M.D., since July, 1947, Scientific Director of the National Cancer Institute, is the head of the experimental therapeutics section that has been set up in the new Microbiological Institute of the National Institutes of Health.

NATHAN B. EDDY, M.D., leader in investigating the use of new narcotics for the control of pain in cancer at the National Institutes of Health, has been elected chairman of the Expert Committee on Habit Forming Drugs of WHO.

VIRGINIA B. ELLIMAN, for the past 2 years Director of Nursing Service for the Eastern Area of the American National Red Cross, has been appointed National Director of Disaster Nursing and Nurse Enrollment for the organization.

WILLIAM GRODOWITZ,† has recently transferred from the Marriage and Divorce Analysis Section of the National Office of Vital Statistics to the Statistics Section of the Cancer Institute, Bethesda, Md.

HARVARD UNIVERSITY, CAMBRIDGE, MASS.

The following appointments have been made to the faculty of the School of Public Health:

WILLIAM M. SCHMIDT, M.D.,* associate professor of maternal and child health practice.

ALFRED L. FRECHETTE, M.D.,* Promoted from instructor to assistant professor of public health practice.

CHARLES R. WILLIAMS, M.D., Promoted from instructor to assistant professor of industrial hygiene.

---

* Fellow A.P.H.A.
† Member A.P.H.A.

JOSEPH HIRSH, Ed.D.,* has been appointed a member of the Medical Advisory Commission of the Division of Alcohol Studies and Rehabilitation of the Virginia State Department of Health.

MAX C. IGLOE, M.D.,† is the new head of the Chicago Health Department's District Health Services Division and has also been appointed associate professor in the department of preventive medicine and public health, University of Illinois College of Medicine, Chicago.

ELMORE P. KALBAUGH, M.D., has recently been assigned by the U. S. Public Health Service to serve as Director of the Division of Tuberculosis Control, Arizona State Health Department.

CLAYTON G. LOOSLI, M.D.,† Associate Professor of Medicine, and Director of the Student Health Service of the University of Chicago, has been appointed to take charge of the Division of Preventive Medicine and Public Health in the School of Medicine, where he will be in charge of projects concerned with problems of preventive medicine in both industrial and general public health areas.

MARION MCBEE, for many years Executive Secretary of the New York City Committee on Mental Hygiene of the State Charities Aid Association, has been made Director, division on state and local organization, of The National Committee for Mental Hygiene.

ABBOTT B. MITCHELL, M.D., M.P.H.,* formerly with the Michigan State Department of Health, became Jackson County, Oregon, Health Officer February 1, succeeding A. ERIN MERKEL,† resigned.

PHILIP E. NELBACH,† public health specialist and executive director of the United Yugoslav Relief Fund of America, has been reëlected to the Board of Directors of CARE for 1949.

PHILIP J. RAFLE, M.D., M.P.H.,* New York City Regional Director, New York State Department of Health, has resigned to become Commissioner of Health in Suffolk County, with headquarters at Riverhead, N. Y., succeeding ARTHUR T. DAVIS, M.D., deceased.

NINA RIDENOUR, most recently director, National Committee for Mental Hygiene, division on world affairs, is now Director of the division of education.

DOROTHY ROUSE, has succeeded JANE E. MYERS as Chief of Occupational Therapy of the Veterans Administration Physical Medicine Rehabilitation Service.

HERBERT I. SCHEFFER, M.D.,† has been appointed Director, Bureau of Medical and Hospital Services of the New York City Department of Hospitals. Dr. Scheffer formerly was Medical Superintendent of Metropolitan Hospital, New York City.

CECIL A. Z. SHARP, M.D., M.S.P.H.,* Commissioner of Health for St. Louis County, Missouri, and Assistant Professor of Public Health at Washington University School of Medicine, resigned in November, 1948, to become St. Louis Area Medical Administrator for the United Mine Workers of American Welfare and Retirement Fund.

MARION SHEAHAN,* who recently retired as Director of the Division of Public Health Nursing, New York State Department of Health, Albany, is serving during the spring term as Visiting Associate Professor in Public Health Administration at the School of Public Health, University of California, Berkeley.

RICHARD E. SHOPE, M.D., member of the Rockefeller Institute for Medical Research, New York, N. Y., has been appointed Associate Director of the Merck Institute for Therapeutic Research, Rahway, N. J.

JOSEPH SMITH, M.D.,* has been appointed Superintendent of the Provi-

dence, R. I., Department of Health, succeeding MICHAEL J. NESTOR, M.D., deceased.

CATHERINE SNOW, became Health Educator of the Macon County (Illinois) Tuberculosis and Visiting Nurse Association in January.

ANATOLE A. SOLOW,† formerly a staff member of the A.P.H.A. Committee on the Hygiene of Housing in New Haven, Conn., has left for a 3 months' advisory consultation on town planning to the Israeli Government in Palestine.

R. M. SORENSON, M.D.,* who served for some years with the Iowa State Department of Health in Venereal Disease Control, is now Director of Venereal Disease Control for the Health Department of the City and County of Denver, Colo.

FRANCES A. STOLL,* of New York City, President of the American Dental Hygienists Association, has been named consultant in dental hygiene for the Veterans Administration. She is the first dental hygiene consultant to serve with Veterans Administration.

LEONARD W. TRAGER, Director of the Division of Sanitary Engineering and Technical Secretary of the New Hampshire Water Pollution Board, has resigned to become Chief, New England Drainage Basin, District on Stream Pollution Control, U. S. Public Health Service, with headquarters in Boston.

ELAINE UPDYKE, Sc.D.,† who has served at the State Bureau of Laboratories, Grand Rapids, Mich., as a staff member of the A.P.H.A., under the Pertussis Study Project, has resigned to join the staff of the Communicable Disease Center, U. S. Public Health Service, in Atlanta, Ga.

V. M. WINKLE, M.D.,* formerly Director of the Division of Local Health Administration, Kansas State Board of Health, is now Director of the Kansas City-Wyandotte County Health Department, a full-time unit.

I. JACQUES YETWIN, M.D.,† Chairman of the Springfield, Mass., Chapter of the American Association for the Advancement of Science was appointed Professor of Parasitology at American International College, Springfield, Mass., as of February, 1949.

JAMES ZETEK, of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, has received the Republic of Panama's highest award, The Vasco Nunez de Balboa decoration in recognition of his work on entomological and other biological problems of Panama and the Canal Zone.

Deaths

A. PERRY BANTA,† Associate Professor of Sanitary Engineering, California Institute of Technology (Engineering Section).

GOODMAN BARE, M.D.,† Anderson County Health Department, Anderson, S. C. (Health Officers Section).

JACOB R. BITNER,† Superintendent of Schools, Columbus, Neb. (Public Health Education Section).

HARVEY J. BURKHART, D.D.S.,† Director, Eastman Dental Dispensary, Rochester, N. Y. (Maternal and Child Health Section).

ALLSTON BURR,† Chestnut Hill, Mass. (Unaffiliated).

ISIDOR J. EHLIN, M.D.,† Social Hygiene Clinic, New York City Health Department (Industrial Hygiene Section).

WALTER J. FARRELL, M.D.,† Health Officer and School Physician, Johnson City, N. Y. (Health Officers Section).

CARL J. HAWLEY, M.D.,† Director, Division of Epidemiology, Los Angeles City Health Department (Health Officers Section).

W. SCOTT JOHNSON,* Chief Engineer and Director, Section of Environ-

* Fellow A.P.H.A.
† Member A.P.H.A.

mental Sanitation, Missouri Division of Health, died recently (Engineering Section).

PATRICK J. MONAGHAN,† Newark, N. J. (Engineering Section).

MARY E. MURPHY,† Director of the Elizabeth McCormick Memorial Fund, Chicago, Ill., and internationally known authority on child welfare, died suddenly on December 25, 1948.

JOHN J. SIPPY, M.D.,* Health Officer, San Joaquin Local Health District, Calif., died March 15 (Health Officers Section).

Conferences and Dates

American Public Health Association—77th Annual Meeting. New York, N. Y. October 24–28.

American Society of Medical Technologists. Hotel Roanoke, Roanoke, Va. June 20–23.

American Water Works Association:
- 69th Annual Conference. Stevens Hotel, Chicago, Ill. May 30–June 3.
- California Section. April 29.
- Canadian Section. April 24–27.
- Indiana Section. April 20–22.
- Kansas Section. April 21–22.
- Nebraska Section. April 21–22.
- New Jersey Section Outing. June 23.
- New York Section. April 28–29.
- Pacific Northwest Section. May 12–14.

Antibiotics Study Section of the National Institutes of Health. Second National Symposium on Recent Advances in Antibiotics Research. Washington, D. C. April 11–12.

Arizona Public Health Association. Hassayampa Hotel. Prescott, Ariz. May 12–13.

Association for Physical and Mental Rehabilitation. Third Annual Convention. Hotel New Yorker, New York, N. Y. May 18–21.

Colorado Public Health Association. Vail Hotel, Pueblo, Colo. May 23–24.

Commonwealth and Empire Health and Tuberculosis Conference. Central Hall, London, England. July 5–8.

Connecticut Public Health Association. New Haven, Conn. June 14.

First Congress International Hospital Association. Amsterdam and Groningen, Holland. May 30–June 4.

Georgia Public Health Association. DeSoto Hotel, Savannah, Ga. May 2–4.

Health Officers and Public Health Nurses of New York State. Lake Placid, N. Y. June 20–23.

International Congress on Rheumatic Diseases. New York, N. Y. May 30–June 3.

Iowa Public Health Association. Des Moines, Iowa. June 2–3.

Kansas Public Health Association. Hotel Besse, Pittsburgh, Kan. April 25–27.

Massachusetts Public Health Association. Amherst, Mass. June 15–17.

Michigan Public Health Association. Hotel Statler, Detroit, Mich. November 9–11.

Middle States Region Health Educators Conference. Milwaukee, Wis. May 11–13.

Minnesota Public Health Conference. Nicollet Hotel, Minneapolis, Minn. September 30.

Missouri Public Health Association. Jefferson City, Mo. May 4–6.

National Convention of the American Red Cross. Atlantic City, N. J. June 27–30.

National Social Welfare Assembly. Hotel New Yorker, New York, N. Y. May 18.

National Tuberculosis Association. Detroit, Mich. Week of May 2.

Royal Sanitary Institute. Brighton, England. May 23–27.

Society of American Bacteriologists. Cincinnati, Ohio. Hotel Netherland Plaza. May 16–20.

South Carolina Public Health Association. Gloria Theater. Myrtle Beach, S. C. May 30–June 1.

Southern Branch, American Public Health Association. Baker Hotel, Dallas, Tex. April 14–16.

Tennessee Public Health Association. Andrew Jackson Hotel. Nashville, Tenn. May 2–4.

United States-Mexico Border Public Health Association. Nogales, Ariz., and Nogales, Sonora, Mexico. April 27–29.

Western Branch American Public Health Association. Biltmore Hotel, Los Angeles, Calif. May 30–June 1.

West Virginia Public Health Association. Daniel Boone Hotel, Charleston, W. Va. June 2–3.

Chloro-Sharp

a new test that shows if

solution for sanitizing contains 50 ppm or more available chlorine. One tablet in 4 ml. solution quickly shows RED indicating *less than 50 ppm Cl* or YELLOW indicating *50 ppm or more.*

Very useful in restaurants, dairies, and for Department of Health Inspectors.

Write for Sample

CARGILLE SCIENTIFIC INC.
118 Liberty St., New York 6, N. Y.

The Association acknowledges with deep appreciation its indebtedness to its Sustaining Members whose annual dues help support the Association's general program

Sustaining Members of the American Public Health Association

American Bottlers of Carbonated Beverages, Washington, D. C.
Ames Company, Inc., Elkhart, Ind.
Association for the Aid of Crippled Children, New York, N. Y.
Borden Company, New York, N. Y.
Chlorine Institute, Inc., New York, N. Y.
Difco Laboratories, Inc., Detroit, Mich.
Diversey Corporation, Chicago, Ill.
Equitable Life Assurance Society of the United States, New York, N. Y.
John Hancock Mutual Life Insurance Company, Boston, Mass.
Hellige, Inc., Long Island City, N. Y.
Hoffman-La Roche, Inc., Nutley, N. J.
Holland-Rantos Company, Inc., New York, N. Y.
International Association of Ice Cream Manufacturers, Washington, D. C.
International Equipment Company, Boston, Mass.
Josam Manufacturing Company, Cleveland, Ohio
Lederle Laboratories Division, American Cyanamid Co., New York, N. Y.
Liberty Mutual Insurance Company, Boston, Mass.
Life Insurance Co. of Virginia, Richmond, Va.
Macmillan Company, New York, N. Y.
George W. Merck, Rahway, N. J.
Metropolitan Life Insurance Company, New York, N. Y.
National Life Insurance Co., Montpelier, Vt.
Oval Wood Dish Corp., Tupper Lake, N. Y.
Prudential Insurance Company of America, Newark, N. J.
Sealright Company, Inc., Fulton, N. Y.
Sharp and Dohme, Inc., Glenolden, Pa.
E. R. Squibb and Sons, New York, N. Y.
Sun Life Insurance Company, Baltimore, Md.
Travelers Insurance Company, Hartford, Conn.
Union Central Life Insurance Company, Cincinnati, Ohio
Upjohn Company, Kalamazoo, Mich.
West Disinfecting Co., Long Island City, N. Y.
Western and Southern Life Insurance Company, Cincinnati, Ohio
Winthrop-Stearns, Inc., New York, N. Y.
Wyeth, Inc., Philadelphia, Pa.

Laboratory tested and Controlled

TO DO A BETTER SANITIZING JOB

EVERY TIME

THE ORIGINAL QUATERNARY AMMONIUM GERMICIDE

243189R

This Control No. Guarantees

POTENCY
UNIFORMITY
QUALITY

Insist on getting only

GENUINE **Roccal** BRAND

Reg. U. S. Pat. Off. and Canada

SANITIZING AGENT

The sanitizing properties of quaternary ammonium compounds are so well known to public health officials that little could be said about them that you do not know. Almost everybody in public health work has added the "quats" to the armamentarium he uses in his war on disease.

The question then, is which "quat"? Are they all alike? Which one can I depend on to do the job expected of it *every* time?

In Roccal, the original quaternary ammonium germicide, you are offered a product that is always uniform in quality because it is made under the most rigid controls. Every batch must pass the comprehensive laboratory tests of one of the world's leading pharmaceutical manufacturers. You can depend on Roccal to do a better sanitizing job *every* time!

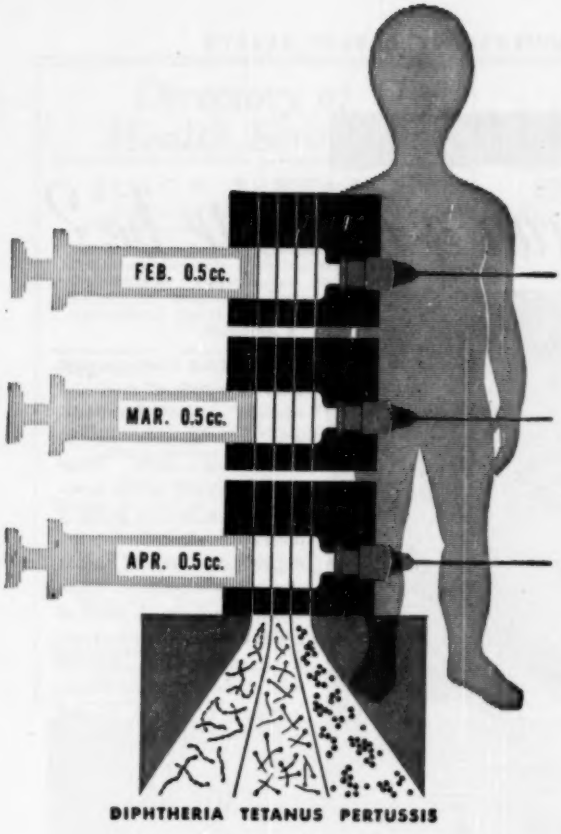
When you specify a "quat"
BE SURE IT'S GENUINE ROCCAL

SPECIAL MARKETS—INDUSTRIAL DIVISION

WINTHROP-STEARNS

Winthrop-Stearns INC.

170 VARICK STREET, NEW YORK 13, N. Y.—WINDSOR, ONTARIO, CANADA



SIMPLIFIED simultaneous immunization

"... a decrease in the number of injections will go far to make the practice of pediatrics more tolerable." (Fischer: J. A. M. A. 134:1064, 1947)

Office routine simplified . . . each injection is the same—0.5 cc.
Patient discomfort and reactions minimized
Lower expense for physicians and institutions
Easier injection because the product is exceptionally fluid

1.5 cc. vials—1 complete immunization; 7.5 cc. vials—5 complete immunizations.

DIPHTHERIA
and
TETANUS TOXOIDS
Alum Precipitated and
PERTUSSIS VACCINE

COMBINED SQUIBB

How mild can a cigarette be?

In a recent coast-to-coast test, hundreds of men and women smoked Camels—and only Camels—for 30 consecutive days. These people smoked on the average of one to two packs a day. Each week, during the entire test period, throat specialists examined these Camel smokers. A total of 2470 careful examinations were made. The doctors who made the throat examinations of these Camel smokers reported:

"NOT ONE SINGLE CASE OF THROAT IRRITATION due to smoking CAMELS!"

According to a Nationwide survey:

MORE DOCTORS SMOKE CAMELS

than any other cigarette

Doctors smoke for pleasure, too! And when three leading independent research organizations asked 113,597 doctors what cigarette they smoked, the brand named most was Camel!

Money-Back Guarantee!

Smoke Camels and test them in your own "T-Zone"—T for taste, T for throat. If, at any time, you are not convinced that Camels are the mildest cigarette you have ever smoked, return the package with the unused Camels and we will refund its full purchase price, plus postage. *(Signed)* R. J. Reynolds Tobacco Co., Winston-Salem, North Carolina.

Directory of Health Service

BLACK & VEATCH
CONSULTING ENGINEERS
4706 Broadway, Kansas City 2, Mo.
Water Supply Purification and Distribution; Electric Lighting and Power Generation, Transmission and Distribution; Sewerage and Sewage Disposal; Valuations, Special Investigations and Reports.

ANALYSTS • CONSULTANTS
BACTERIOLOGISTS
Industrial and Sanitary Problems
Bendiner & Schlesinger, Inc.
Third Avenue and Tenth Street
New York 3, N. Y.
Telephone ALgonquin 4-2300
Serving the field of Public Health over 50 yrs.

THE MERIT SYSTEM SERVICE
A Personnel Administration Service in the Field of Public Health
Available to
State and Local Health Departments
and
Merit Systems
Examinations Field Consultation
American Public Health Association
1790 Broadway, New York 19, N. Y.

PED-X
KILLS LICE AND NITS
in
ONE APPLICATION
gives
Protection Against Reinfestation for at Least Two Weeks
SO EASY TO USE
applied like a refreshing shampoo.
Write for descriptive literature.
THE GART PHARMACAL COMPANY
6118 Laurel Hill Blvd. Woodside, N. Y.

The B-K PR PLAN stands for better patron relations between farmer and dairy plant. As the basis for this, a complete program has been set up by the makers of B-K to help the farmer produce top quality milk through a definite and efficient dairy sanitation program.

This B-K PR PLAN offers the dairy farmer . . . through his fieldman . . . informative films, recordings, literature and other educational material . . . that directs the farmer's attention to the need for positive dairy sanitation.

You can depend on the authenticity and accuracy of the material used in this B-K PR PLAN, for it has been carefully prepared by the makers of B-K Products—the backbone of many quality milk programs. Find out more about the B-K PR PLAN and how you can play a part . . . we'll send full details on request. Write: Dept. PR, B-K Division, Pennsylvania Salt Manufacturing Company, 1000 Widener Building, Philadelphia 7, Pa.

PENN SALT
dairy chemicals

More light on Ice Cream's food value

Now, actual analyses show ice cream to be a better source of vital nutrients than previously believed

It is now established that ice cream can make an important contribution to the daily intake of many dietary essentials.

Heretofore, our knowledge of the individual nutrients of ice cream was based entirely on calculated values. Only recently have actual *analytical* data on the food value of ice cream been made available.

The first complete data on commercial ice cream of specified composition are contained in the work of Dahlberg and Loosli.* For this study, vanilla ice cream was manufactured in a commercial plant according to standard procedures but under scientifically controlled conditions.

These analytical data show that, in general, we had underestimated the nutritive content of ice cream. This was particularly true of riboflavin and vitamin A.

Here are the results of that work:

Nutrient Content of 100 Grams of Vanilla Ice Cream* (approximate measure = ⅛ quart)

Food Energy—206 Calories	Iron—0.12 Milligrams
Protein—3.85 Grams	Vitamin A—548 I.U.
Fat—12.06 Grams	Thiamine—0.04 Milligrams
Calcium—0.1 Grams	Riboflavin—0.24 Milligrams
Phosphorus—0.11 Grams	Niacin—0.10 Milligrams

It is gratifying to those of us intimately concerned with nutrition problems to know that ice cream is even better nutritionally than we had thought. These reliable figures on the food value of ice cream will meet a need long felt by everyone concerned with planning adequate diets, whether to please normal appetites, or the often difficult appetites of the convalescent and the aged.

*Dahlberg, A. C. and Loosli, J. K. *Nutritive value of commercial ice cream.* J. Am. Diet. Assn. *24*:20 (Jan.) 1948.

National DAIRY COUNCIL

111 North Canal Street • Chicago 6, Illinois

The presence of this seal indicates that all nutrition statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and to education in the use of dairy products.

Candy

MORE THAN JUST FOOD

Although candies are an excellent source of caloric food energy, and supply many valuable nutrients derived from the milk, cream, butter, nuts, peanuts, and eggs used in their manufacture, they provide more than calories and nutrients.

Candies make a worth-while contribution to the joy of living. They are among the foods which provide true gustatory satisfaction. Taken at the end of a meal, they create a sense of having eaten well and are conducive to an aura of satiety which can have a beneficial influence upon the digestive processes.

The child, the housewife, the worker, and the convalescent —all appreciate a piece or two of candy as the finishing touch of the mid-day or evening meal.

THE NUTRITIONAL PLATFORM OF CANDY

1. Candies in general supply high caloric value in small bulk.
2. Sugar supplied by candy requires little digestive effort to yield available energy.
3. Those candies, in the manufacture of which milk, butter, eggs, fruits, nuts, or peanuts are used, to this extent also—
   (a) provide biologically adequate proteins and fats rich in the unsaturated fatty acids;
   (b) present appreciable amounts of the important minerals calcium, phosphorus, and iron;
   (c) contribute the niacin, and the small amounts of thiamine and riboflavin, contained in these ingredients.
4. Candies are of high satiety value; eaten after meals, they contribute to the sense of satisfaction and well-being a meal should bring; eaten in moderation between meals, they stave off hunger.
5. Candy is more than a mere source of nutriment—it is a morale builder, a contribution to the joy of living.
6. Candy is unique among all foods in that it shows relatively less tendency to undergo spoilage, chemical or bacterial.

This Platform is Acceptable for Advertising in the Publications of the American Medical Association

COUNCIL ON CANDY OF THE *National Confectioners' Association*

1 NORTH LA SALLE STREET CHICAGO 2, ILLINOIS

HETRAZAN*

Diethylcarbamazine

Lederle

Partial view of Lederle Laboratories, Pearl River, New York

This entirely new development in parasitology is an organic compound that does not contain any heavy metals or similar toxic ingredients. It is the result of long and arduous research, during which more than 1,000 organic synthetic compounds were examined by *Lederle*. This product has been tested in India, Africa, Tahiti, Puerto Rico, British Guiana, and the Virgin Islands. It has been found to have the following advantages—

LOW TOXICITY—Previously, antiparasitic drugs of this type exerted a toxicity upon the host only slightly less than the toxicity upon the parasite.

EASE OF ADMINISTRATION—This drug is readily absorbed when given by mouth, and may be given after meals.

STABILITY—This organic substance is stable under tropical conditions.

IMMEDIATE EFFECTIVENESS—The microfilariae are killed almost instantly.

*Reg. U. S. Pat. Off.

LEDERLE LABORATORIES DIVISION

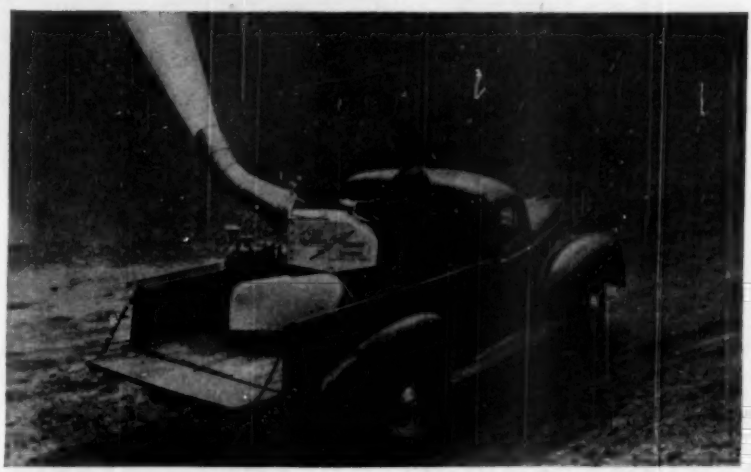
AMERICAN *Cyanamid* COMPANY

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

A New Aid to Public Health

by

"LAWRENCE"



NEW 700 POUND "AERO-MIST" SPRAYER IDEAL FOR MUNICIPAL INSECT CONTROL PROGRAMS

In addition to its famous L-80 heavy duty mist sprayer "LAWRENCE" now offers in a smaller sprayer, ALL of the exclusive and scientific features, which have made "LAWRENCE" the name to remember in mist sprayers.

Efficient, compact, and economical, the L-40 LAWRENCE AERO-MIST SPRAYER is especially suitable for municipalities where the program is not large enough for the L-80 heavy duty mist sprayer, or for health departments desiring equipment for their own use apart from other municipal operations.

Here is the newest advance in the control of annoying and dangerous insect pests.

Hard-to-get-at spraying areas can be covered easily, quickly, and thoroughly with the L-40 mounted on a small truck or trailer. Like the heavy-duty unit, the L-40 can operate in a 360° circle and on any plane, automatically eliminating blind spots.

WRITE, WIRE or PHONE COLLECT
FOR COMPLETE DETAILS TODAY

THE LAWRENCE AERO-MIST SPRAYER CO.
58E Federal Street Greenfield, Massachusetts

IODINE

Essential Ally of the Profession for

Prevention . . . Diagnosis . . . Therapy

In addition to the many Iodine specialties, the following Iodine preparations, official in United States Pharmacopoeia XIII and National Formulary VIII, are widely prescribed in everyday practice:

U.S.P. XIII

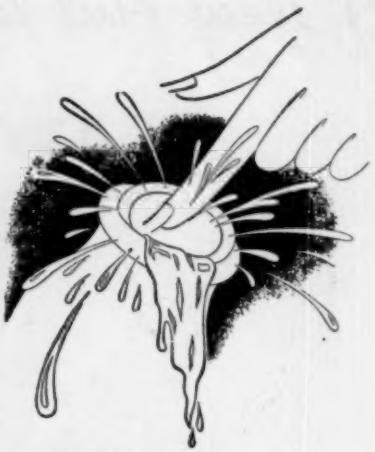
CALCIUM IODOBEHENATE
CHINIOFON
DILUTED HYDRIODIC ACID
HYDRIODIC ACID SYRUP
IODINE
STRONG IODINE SOLUTION (LUGOL'S)
IODINE TINCTURE
IODIZED OIL
IODOPHTHALEIN SODIUM
IODOPYRACET INJECTION
POTASSIUM IODIDE
SODIUM IODIDE

N.F. VIII

AMMONIUM IODIDE
FERROUS IODIDE SYRUP
IODINE AMPULS
IODINE OINTMENT
IODINE SOLUTION
PHENOLATED IODINE SOLUTION
STRONG IODINE TINCTURE
IODOCHLOROHYDROXYQUINOLINE
IODOCHLOROHYDROXYQUINOLINE TABLETS
IODOFORM
POTASSIUM IODIDE SOLUTION
POTASSIUM IODIDE TABLETS
COLLOIDAL SILVER IODIDE
SODIUM IODIDE AMPULS
THYMOL IODIDE

An Antiseptic of Choice
IODINE TINCTURE U.S.P. XIII (2%)

IODINE EDUCATIONAL BUREAU, Inc.
120 BROADWAY, NEW YORK 5, N. Y.



PROTECTS CONSUMERS AGAINST *THEMSELVES!*

Milk contamination can too often occur in the hands of the ultimate consumer. Fork-prying and finger-pushing methods of opening bottles and careless discarding of a separate hood—common in both home and restaurant—constitute real threats to milk purity.

Genuine snug-fitting Seal-Kaps minimize these dangers. Seal-Kaps come off with a simple twisting motion. No need to pry or push. And they *snap back on* as often as necessary to protect securely the pouring lip until the last drop is used. There is no separate hood to discard, because Seal-Kap is disc and hood *in one.* And since it's so convenient to use, consumers automatically enjoy a superior protection—protection *against themselves!*

AMERICAN SEAL-KAP CORP.
11-05 44TH DRIVE, LONG ISLAND CITY 1, N.Y.

Fisher

ELECTROPHOTOMETER

—eliminates the human factor—

The Fisher Electrophotometer permits colorimetric analyses to be made accurately, quickly and simply wherever the color of the solution varies in a definite manner with the concentration of a constituent. Because of its unique, valuable features, the Electrophotometer is now widely employed for conducting many essential routine analyses and for research.

The Electrophotometer operates from any 110 volt, 50-60 cycle line. With it, the user can detect very slight color intensity differences because the photoelectric system it employs is considerably more sensitive and reliable than the human eye. Once a calibration is made, subsequent analyses can be conducted as rapidly as the simple operations can be performed.

Fisher Electrophotometer, complete with galvanometer, three filters, three 23-ml. absorption cells, manual of typical procedures for use with 110 volts, 50-60 cycle A.C. only $210.00

Headquarters for Laboratory Supplies

FISHER SCIENTIFIC CO.
717 Forbes St., **Pittsburgh (19), Pa.**
2109 Locust St., **St. Louis (3), Mo.**

EIMER AND AMEND
Greenwich and Morton Streets
New York (14), New York

In Canada: Fisher Scientific Co., Ltd., 904 St. James Street, Montreal, Quebec

"Our fountain is lots cleaner and safer . . . with DIXIE CUPS"

DIXIE CUP

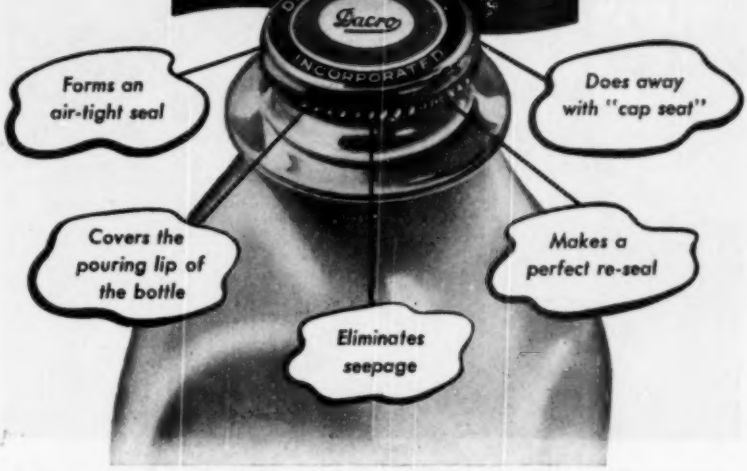
"Dixie" is a registered trade mark of the Dixie Cup Company

Cleaner because there's no clutter of "dirties" at the sink — no risk of half-done dishwashing, sanitizing. Safer because there's no chance of spreading colds, flu and other mouth-borne infections. Certainly inspection at a "Dixie fountain" is easier and faster for you, because every Dixie guards public health!

DIXIE CUPS, VORTEX CUPS AND PAC-KUP CONTAINERS ARE MADE AT EASTON, PA., CHICAGO, ILL., DARLINGTON, S. C., FT. SMITH, ARK., TORONTO, CANADA

When writing to Advertisers, say you saw it in the JOURNAL

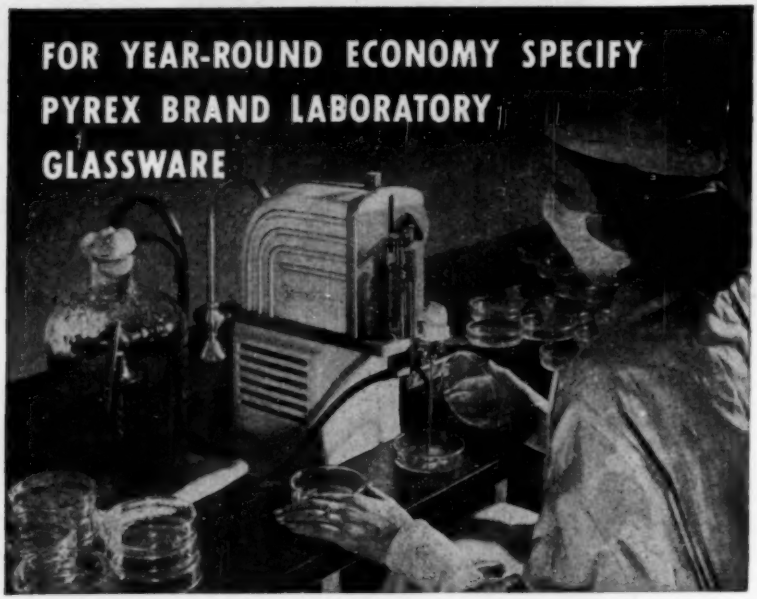
Dacro P-38



These famous features have made Dacro Protected milk the safest money can buy. Dacro P-38 has them all, and in addition gives the dairyman the economy of a smaller cap, plus all of the operating advantages of the Dacro Capping System.

CROWN CORK & SEAL COMPANY

Dacro Division • Baltimore 3, Md.



BACK of the year-round economy you obtain with PYREX brand laboratory glassware is Corning's long interest in the field of public health. For many years, Corning researchers have done a great deal of development work on glassware to serve your increasingly important requirements.

PYREX brand culture tubes, pipettes, petri dishes, milk-dilution bottles, culture flasks and bacteria filters, for example, are made to exacting standards of chemical glass No. 774. It possesses properties which provide maximum mechanical strength, heat resistance and chemical stability. This means longer service life, greater economy.

Consult your laboratory dealer now. He stocks PYREX brand laboratory ware for you and can give you prompt service.

CORNING means research in GLASS

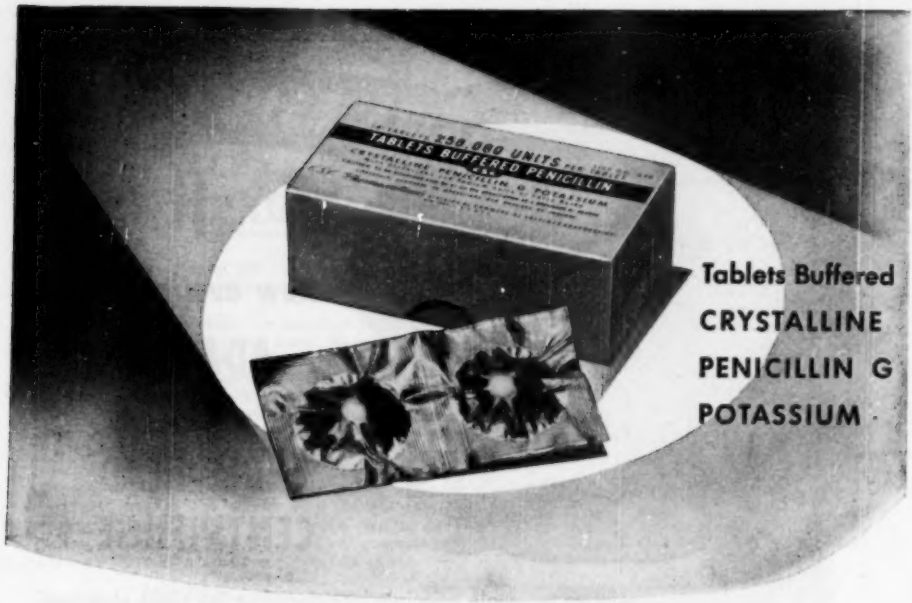
PYREX

Stocked by Leading Laboratory Supply Houses

CORNING GLASS WORKS • CORNING, N. Y.

LABORATORY GLASSWARE

TECHNICAL PRODUCTS DIVISION: LABORATORY GLASSWARE • GAUGE GLASSES • GLASS PIPE
LIGHTINGWARE • SIGNALWARE • OPTICAL GLASS • GLASS COMPONENTS



250,000 UNITS

In the Oral Prophylaxis of Gonorrhea

By means of a single orally administered dose of penicillin taken as soon as possible after exposure, and preferably within 2 hours, the development of gonorrhea can usually be prevented. In a recently reported preliminary study,* the incidence of infection was dropped from 43 cases in 3,616 liberties among untreated controls to 2 cases in 1,239 liberties; there is reason to believe the two infections may have been due to failure to take the medication after exposure.

The subjects received a single buffered tablet of penicillin containing 250,000 units. No contraindications to this practice were detected. Ideally, the penicillin should be taken within two hours after exposure, but some protection is afforded even after an interval of six to eight hours.

Tablets Buffered Crystalline Penicillin G Potassium-C.S.C., individually wrapped in foil, are supplied in two potencies: 250,000 units each and 500,000 units each, in boxes of ten. Either may be employed, depending upon the clinical situation.

*Eagle, H.; Gude, A. V.; Beckman, G. E.; Mast, G.; Sapero, J. J., and Shindledecker, J. B.: Prevention of Gonorrhea with Penicillin Tablets. Preliminary Report, Pub. Health Rep. 63:1411 (Oct. 29) 1948.

C.S.C. Pharmaceuticals

A DIVISION OF COMMERCIAL SOLVENTS CORPORATION • 17 EAST 42nd STREET • NEW YORK 17, N. Y.

Now available!

ADAMS 12 - PLACE ANGLE-HEAD CENTRIFUGE

FEATURES

- Utilizes the angle principle by suspending the tubes at a fixed 52° angle, thus achieving a faster rate of sedimentation and more complete sedimentation with finely dispersed particles.
- Accommodates 12 blood tubes of the commonly used sizes, 6 blood tubes and 6 15-ml. tubes, or 6 15-ml. tubes.
- Can be used for micro and semi-micro work by substituting the proper shields.
- Head is made of a special aluminum alloy, precision-machined for accurate balance.
- Base and guard bowl are an integral aluminum casting, carefully inspected to insure against flaws.
- Rheostat provides an "off" position and allows for continuous speed control.
- Rubber suction feet absorb all vibration and keep the centrifuge from creeping, even on a glass surface.
- Finished in attractive gray hammertone.
- Operates on 110 volts, AC and DC.

CT-1230/D ***Adams Safeguard Angle-Head Centrifuge, 12 Place;*** complete with head and 12 brass shields; without glassware.....each **$105.00**

220-volt models supplied at additional cost of $3.00.

Write for Circular describing our complete line of centrifuges.

CLAY-ADAMS COMPANY, INC.
141 EAST 25th STREET · NEW YORK 10
Showrooms also at 308 West Washington Street, CHICAGO 6, ILL.

ADAMS

POUR DIRT AWAY *with* Rexair

Wouldn't you like to get rid of dusty vacuum bags forever? Wouldn't you like to pour dust away as easily as dirty dishwater?

You can, with Rexair—the amazing new home appliance that washes your dust away. Rexair collects dust in water; you just pour the water down the drain and flush—dust and dirt go with it.

When you clean with Rexair, you clean *clean.* Rexair has no porous bag through which dust can escape back into the air you breathe. Instead, the air passes through a churning bath of water which wets down the dust and returns only dust-free air to the room. Wet dust cannot fly, and dust cannot escape from Rexair's water basin.

Rexair washes the air in your home, humidifies, vaporizes medicaments, even scrubs floors. See the Rexair before you buy a humidifier, a vaporizer, or even a vacuum cleaner. Over 1,000,000 in use.

FREE BOOK: Send for this free, illustrated 12-page book. Shows how Rexair even cleans the air you breathe. REXAIR DIVISION, MARTIN-PARRY CORP. Box 964, Toledo 1, Ohio, Dept. P-49

Rexair

APPLICATION FOR MEMBERSHIP

NAME ..... Birth Date .....
(please print)

MAILING ADDRESS .....
(street) (city or town) (state)

EDUCATION (give schools, dates and degrees; if no degrees received, say "none")

.....

PROFESSIONAL SOCIETIES
OF WHICH A MEMBER .....

EXPERIENCE (show recent positions, giving titles, names of organizations and years of tenure)

.....

.....

PRESENT OCCUPATION .....
(title of position)

.....
(name of organization) (part or full time) (date employed)

Remarks to describe character of work if not indicated by title .....

.....

AMERICAN PUBLIC HEALTH ASSOCIATION

1790 Broadway at 58th Street **New York 19, N. Y.**

Please complete application on reverse side

TESTING REAGENTS
for Hematology and Serology

Anti-A and Anti-B Serum
for Blood Grouping

Anti-Rh Serum
for determining presence of Rh factor

Sub-Groups of Anti-Rh Serum

Coombs' Serum
for antibody test

Anti-M and Anti-N Serum
for paternity tests

Absorbed B Serum
to differentiate between A_1 and A_2

Human Red Cells
for research work or controls

Sheep Cells

Complement

Amboceptor

Kline Antigen

Kahn Antigen

Mazzini Antigen

Kolmer Antigen

Positive Syphilitic serum
for control tests

P.S.A.
(Paraffin Section Adhesive)

CERTIFIED BLOOD DONOR SERVICE

146-16 Hillside Avenue **Jamaica 2, New York**

(Continued from previous page)

SECTION IN WHICH MEMBERSHIP IS DESIRED (choose only one)

☐ Health Officers	☐ Engineering	☐ Maternal and Child Health	☐ Epidemiology
☐ Laboratory	☐ Industrial Hygiene	☐ Public Health Education	☐ School Health
☐ Statistics	☐ Food and Nutrition	☐ Public Health Nursing	☐ Dental Health
		☐ Medical Care	☐ Unaffiliated

SPONSORS

Signature ..... **Address** .....

Signature ..... **Address** .....

NOTE: Sponsors must be two members and/or Fellows of the American Public Health Association. It is essential that your application be sponsored, but if you cannot obtain the signatures of two persons affiliated with the Association, write their names and addresses in the spaces above and we will get in touch with them for you.

DUES A remittance for $..... is enclosed. Dues will be paid by .....

..... and a bill should be sent to that address.

Annual membership dues are $7.00 ($7.50 Canada; $8.00 foreign countries exclusive of Latin America) and include a subscription to the American Journal of Public Health as well as the other services maintained by the Association. The membership year is the same as the calendar year. Members joining during the first six months of the year will receive the Journal from January onward. Members joining after July 1st are requested to pay $10.50 (Canada $11.25, foreign $12.00) covering the latter half of the current year and the whole of the ensuing year, the Journal beginning with July of the current year.

DATE ..... **SIGNATURE** .....

When the Diet Assumes

THERAPEUTIC IMPORTANCE

IN MANY gastrointestinal affections, and in the management of the many systemic conditions in which diet assumes therapeutic importance, the cereal serving is particularly valuable.

Consisting of breakfast cereal, milk, and a teaspoonful of sugar, it provides an abundance of essential nutrients and caloric food energy. This time-honored combination is easily digested, bland, and readily utilized. It is well tolerated in the presence of many gastrointestinal conditions and offers the additional advantages of taste appeal, variety, ease of preparation in the home, and economy.

The over-all nutritive value of the cereal serving—1 ounce of ready-to-eat or hot cereal,* 4 ounces of milk, and 1 teaspoonful of sugar—is shown in this table:

CALORIES	202	PHOSPHORUS	206 mg.
PROTEIN	7.1 Gm.	IRON	1.6 mg.
FAT	5.0 Gm.	VITAMIN A	193 I.U.
CARBOHYDRATE	33.0 Gm.	THIAMINE	0.17 mg.
CALCIUM	156 mg.	RIBOFLAVIN	0.24 mg.
		NIACIN	1.4 mg.

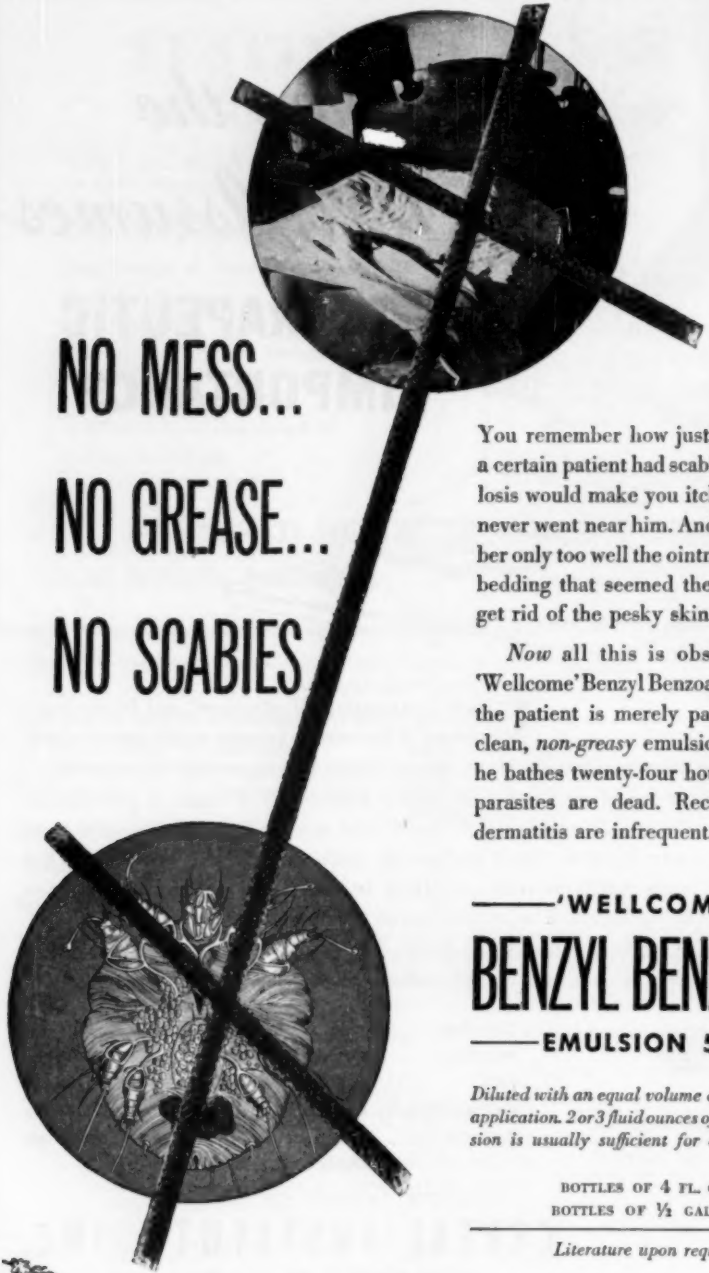
Composite average of all breakfast cereals on dry weight basis.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

CEREAL INSTITUTE, INC.

135 South La Salle Street • Chicago 3, Ill.

A RESEARCH AND EDUCATIONAL ENDEAVOR DEVOTED TO THE BETTERMENT OF NATIONAL NUTRITION



NO MESS...

NO GREASE...

NO SCABIES

You remember how just hearing that a certain patient had scabies or pediculosis would make you itch even if you never went near him. And you remember only too well the ointment-smeared bedding that seemed the only way to get rid of the pesky skin parasites.

Now all this is obsolete. With 'Wellcome' Benzyl Benzoate Emulsion, the patient is merely painted with a clean, *non-greasy* emulsion, and when he bathes twenty-four hours later, the parasites are dead. Recurrence and dermatitis are infrequent.

'WELLCOME' BRAND

BENZYL BENZOATE

EMULSION 50%

Diluted with an equal volume of water before application. 2 or 3 fluid ounces of the 25% emulsion is usually sufficient for one treatment.

BOTTLES OF 4 FL. OZ.
BOTTLES OF ½ GALLON

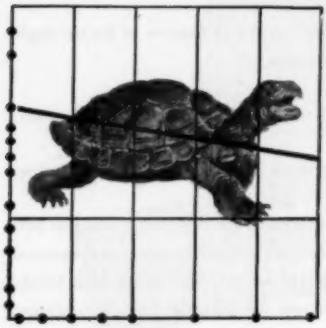
Literature upon request

BURROUGHS WELLCOME & CO. (U.S.A.) INC., 9 & 11 EAST 41st ST., NEW YORK 17

now you can obtain **both**

a RAPID peak concentration of serum penicillin

and



a SUSTAINED therapeutic concentration

with a single injection from a single container

FLO-CILLIN "96"—the *original* 96-hour repository penicillin formulation—is now available with a *plus*. Soluble Penicillin G Potassium—100,000 units per cc.—has been added to the FLO-CILLIN "96" formula. The soluble potassium penicillin is absorbed promptly, with a resulting initial penicillin blood concentration sufficient to overwhelm invading bacteria at the outset. The insoluble Procaine Penicillin G, with water-repellent aluminum stearate in oil, is absorbed slowly and regularly over a period measured in days. Thus, with a single injection from a single container, it is now possible to obtain an initial *peak* penicillin blood level, together with a *therapeutic* blood level which is sustained for 96 hours in approximately 90 per cent of patients.*

CONSTANTLY FLUID

REQUIRES NO PROLONGED SHAKING

WILL NOT SETTLE OUT

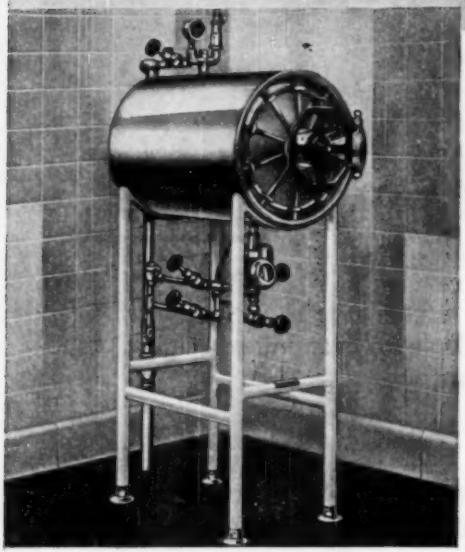
Flo-Cillin "96" FORTIFIED

Bristol Laboratories Trademark for
Procaine Penicillin G (300,000 u./cc.) and Potassium Penicillin G (100,000 u./cc.) In Oil with Aluminum Monostearate, 2%

Available in Cartridges, 1 cc.—Vials, 10 cc.

*Thomas, E. W., et al: *J.A.M.A. 137:1317, 1948*

Compare the precision-efficiency of "AMERICAN" LABORATORY AUTOCLAVES



Steam Jacketed Autoclaves fully capable of drying fabrics—thus accommodate all customary pressure sterilizer loads.

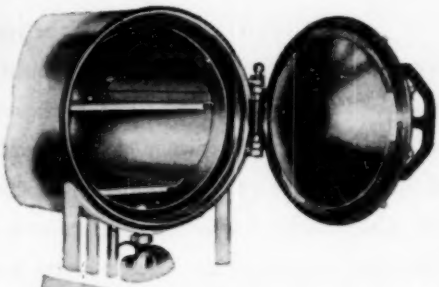
Rapid performance always available because the sterilizer is kept heated between runs by steam in the jacket.

Single Wall Type unexcelled for bacteriologic media, solutions and the many performances required in routine laboratory procedures but without drying facilities for wrapped supplies.

Units include special valving—

- For pressure steam sterilization of bacteriologic media and solutions.
- For coagulation and sterilization of blood serum.
- For non-pressure (streaming steam) sterilization.

These superior Autoclaves also feature controls permitting the exact duplication of a given performance, and are simplified so that even other than highly skilled technicians can operate them with utmost efficiency.



PROTECTS AGAINST PREMATURE EXPLOSIVE OPENING of full diameter door by a pressure actuated clutch preventing rotation of the handwheel until pressure is exhausted.

WRITE TODAY for detailed specifications

AMERICAN STERILIZER COMPANY
Erie, Pennsylvania

DESIGNERS AND MANUFACTURERS OF SURGICAL STERILIZERS, TABLES AND LIGHTS

NEW SPENCER COLONY COUNTER

Even the pinpoint bacterial colonies are easy to count—quickly and accurately—with this new Spencer Dark Field Quebec Colony Counter. Employing the principle of the dark field microscope, it has a unique annular reflector which illuminates the specimen symmetrically with oblique rays of light and leaves the background subdued. As a result it provides:

1. Remarkably uniform illumination—the colonies are lighted from all sides.

2. Greater brilliance—reflector collects and concentrates the light rays.

3. Freedom from glare—only light reflected from the specimen reaches the eyes of the observer.

4. Enclosed illuminating system—protected from dust, yet permitting easy replacement of the household 40 watt lamp.

Equipped with a standard 1.5x lens, this compact, efficient instrument will be welcomed by health departments, hospitals, dairies, breweries, canneries—wherever colony counts are made. Write dept. R-19 for details.

American Optical
COMPANY
Scientific Instrument Division
Buffalo 15, New York

Manufacturers of the **SPENCER** *Scientific Instruments*

In Mongolia and Tibet, milk is delivered on the hoof—by the grunting, shaggy yak, placed in open containers which are never washed, and in no time at all filled with dirt . . . a happy "two-way" home for germs causing milk-borne diseases.

In America Canco flat-top Paper Milk Containers provide a safe, single-trip method of milk delivery. With the help of Public Health officials this sanitary container has gained national acceptance.

1. **Single-trip** feature breaks chain of possible milk-borne infections!
2. **Rinse tests** reveal no Escherichia coli, and a high percentage of complete sterility in containers delivered to the dairy.
3. **Opened, filled,** and closed in minimum time by machines!

CANCO

American Can Company New York, Chicago, San Francisco

THE NINTH EDITION

of

STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS

is now available

This manual, prepared by the Committee on Examination of Milk and Milk Products, outlines procedures for the routine microbiological and chemical examinations of the more common dairy products used as food. It includes directions for enumerating, isolating, and identifying members of the coliform group, *Brucella*, streptococci, tubercle bacilli, *Salmonella*, pathogenic *Shigella*, and enterotoxigenic staphylococci.

The resazurin reduction method for the examination of fluid milk is included in this edition. Procedures are given for the examination of condensed milk, dried milk, evaporated milk and of fruits, nuts, flavoring and coloring materials, eggs and egg products, sweetening ingredients and stabilizers when used as ingredients in frozen desserts.

The primary aim in the new edition is to aid the laboratory worker by maintaining uniformity of arrangement and style, by using a system of simple cross references, and by improving the index. To do this, the first chapter on "Selection and Interpretation of Quality Tests" is organized for the guidance of the administrator. The succeeding twelve chapters, now relatively free from interpretive and explanatory matter, provide tried and tested methods for the laboratory worker. A group of "Screening Tests," which do not have approval for unqualified use, but which permit more frequent examinations than otherwise could be made, appear in the last chapter.

The thirteen chapter headings are listed below.

1. Selection and Interpretation of Quality Tests
2. Microbiological Methods for Milk and Cream
3. Detection of Special Bacterial Groups or Species
4. Microbiological Methods for Butter
5. Microbiological Methods for Cheese
6. Microbiological Methods for Frozen Dessert Ingredients
7. Microbiological Methods for Frozen Desserts
8. Sterility Tests for Dairy Equipment
9. Tests for Sediment and Extraneous Matter in Dairy Products
10. Determination of Vitamins
11. Phosphatase Methods to Determine Pasteurization
12. Chemical Methods
13. Screening Tests

373 pages, 37 illustrations **Published 1948** **Price, $4.00**

Available from

The American Public Health Association

1790 Broadway at 58th Street **New York 19, N Y.**

Public Health

A CAREER WITH A FUTURE

The American Public Health Association has prepared a 20 page illustrated booklet describing the field of public health—its scope, requirements and opportunities.

The purpose of the booklet is recruitment.

See that high schools and colleges in your neighborhood use this booklet. Distribute it when you tell students about the public health jobs in your city and state. Hand it to applicants at your office and see that public libraries have it.

"Public Health—A Career With a Future" discusses educational qualifications and employment opportunities and lists schools where public health training may be secured including the institutions accredited by the Association to give the degree of Master of Public Health.

It will save your time and attract those who will become the public health workers of tomorrow.

Single copies are 15 cents each; 25 to 49 copies are 12 cents each; 50 copies and over are 10 cents each.

Book Service
American Public Health Association
1790 Broadway
New York 19, New York

Date_____

Please send _____ **copies of "Public Health—A Career With a Future" to:**

Name _____

Street _____

City and State _____

The Influence of Timing On Protein Utilization

The biologic importance of complete protein in the daily diet takes on new significance in the light of recent research on the influence of timing upon protein utilization.[1,2]

Protein-depleted animals, maintained on an otherwise adequate diet, rapidly regained weight when fed their complete ration of the ten essential amino acids. When, however, these ten amino acids were not provided simultaneously—five were given at one feeding and the other five in a feeding two hours later—recovery did not occur.

These studies strongly suggest that efficient protein utilization requires simultaneous absorption of the indispensable amino acids. New emphasis is thus given to the rationale of routinely including biologically complete protein in all meals to assure optimal utilization of all the protein ingested.

Meat is an outstanding source of complete protein. Regardless of cut or kind, whether fresh, cured, or canned, all meat contains the ten indispensable amino acids capable of satisfying every protein need of the organism. And, all meat is of excellent digestibility—from 96 to 98 per cent.

---

[1]Cannon, P. R.; Steffee, C. H.; Frazier, L. J.; Rowley, D. A., and Stepto, R.C.: The Influence of Time of Ingestion of Essential Amino Acids upon Utilization in Tissue Synthesis, Fed. Proc. 6:390, 1947.

[2]Geiger, E.: The Role of the Time Factor in Feeding Supplementary Proteins, J. Nutrition 36:813 (Dec. 10) 1948.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

American Meat Institute
Main Office, Chicago...Members Throughout the United States

DIFCO

Penicillin Inactivation

with

BACTO-PENASE

Bacto-Penase is a sterile thermolabile biological extract possessing the capacity to neutralize the antibiotic properties of all known types of *penicillin*. It is non-toxic to microörganisms and is therefore particularly satisfactory for use in the sterility testing of *penicillin* or products containing *penicillin*, and in determining the microbial counts on *penicillin*-containing products. BACTO-PENASE is recommended as a penicillinase for use in official procedures for sterility testing of *penicillin*. It is also recommended for use in media for culturing organisms from blood and other body fluids containing *penicillin* and for estimation of *penicillin* levels in such fluids.

PENICILLIN STERILITY TESTS

BACTO-PENASE in a concentration of 1 ml. per 15 ml. of Bacto-Fluid Thioglycollate Medium inactivates 50,000 units of *penicillin* in 40-48 hours incubation or 10,000 units of *penicillin* in 18 hours incubation.

BLOOD CULTURE

BACTO-PENASE is recommended for use in media for culturing blood or other body fluids containing *penicillin*. It is suggested that 1 ml. of BACTO-PENASE be added to 100 ml. of culture media such as Bacto-Brain Heart Infusion with P.A.B. or Bacto-Brain Heart Infusion with P.A.B. and Agar for this purpose. Media so prepared will inactivate the maximum amount of *penicillin* and sulfonamides present in 10 ml. or less of blood or other body fluids, and will also inactivate up to 1000 units of *streptomycin*.

* * *

Stability. BACTO-PENASE and media containing this penicillinase are stable when stored at refrigerator temperatures (2°-6°C.).

Bacto-Penase Concentrate. BACTO-PENASE is available in concentrated form as BACTO-PENASE CONCENTRATE, 1 ml. of which neutralizes 500,000 units of *penicillin*. BACTO-PENASE CONCENTRATE is recommended in the sterility testing of *penicillin*.

BACTO-PENASE and BACTO-PENASE CONCENTRATE are supplied in standard packages of one-half dozen and one dozen screw cap tubes of 20 ml. each.

Descriptive literature is available upon request.

DIFCO LABORATORIES

DETROIT 1, MICHIGAN